Special Study Paper:

Comparative Study of Factors Influencing ADMADE Success

Prepared by the ADMADE Sustainability Project

For

United States Agency for International Development

In collaboration with

Wildlife Conservation Society of the Bronx Zoo
National Parks and Wildlife Service

CONTENTS

Executive Summary

Rural communities residing in game management areas are discovering the economic importance of wildlife under such programs as ADMADE, but they are also discovering the trade-offs between the rewards the wildlife commercial sector can bring versus the opportunity costs of sustaining these rewards. As a result communities are increasingly trying to think and act as wildlife managers for their private sector interests while also trying to satisfy community needs as land use managers. The outcome of these decisions will likely shape the success of community-based natural resource management (CBNRM) in Zambia and the success of wildlife conservation in this country for years to come.

Throughout most of ADMADE's 10 year history considerable effort has been made to monitor the various processes and variables that influence how communities participate in resource management to increase household benefits. The ADMADE Sustainability Project has undertaken this special study to use these monitoring results to examine possible factors that influence CBNRM success in Zambia and to formulate these results into practical guidelines for enhancing its future success.

This study identified 5 broad 'environmental variables' that contribute to a community's capacity to generate and use revenue derived through ADMADE for enhancing natural resource conservation and community development needs. The variables included were bio-geophysical features, demographic and cultural factors, private sector interests, ADMADE policy variables and donor support to CBNRM development,. Each was composed of numerous sub-variables, giving rise to a potentially complex set of interactions. Developing any single unifying model that might predict CBNRM success would have been an unrealistic objective for this study. Instead, the study chose to look at specific relationships, either analytically with relatively few variables involved or in a more discursive way using case studies, as layers of influence relevant to all GMAs in Zambia practicing CBNRM. What became very clear during this study was the importance of how these different layers can interact and influence the significance of other variables with a cascading set of effects. It was therefore necessary to also analyze these layers of variables in a hierarchical way to better understand their possible linkages.

Summarized here are the most important relationships and lessons identified in this study for strengthening CBNRM in Zambia.

A. Bio-geophysical factors

1. CBNRM areas isolated from protected areas are more easily over-hunted and less able to recover from the effects of over-hunting because of restrictions in the free movement of animals between the two areas. Species most likely affected will be the larger species of greater economic value with relatively low numbers on quota and in high demand by both legal and illegal hunters. Roan, buffalo, lion, sable, and eland are examples of species that fit this category.
2. Capacity to absorb hunting pressure in the GMA by restocking from national parks is diminishing in most areas of Kafue National Park, due to high loss of wildlife in the park from poaching. Similar effects are noted for Lukusuzi and Lunga National Parks. CBNRM efforts should therefore assume increased responsibility for park security, especially along its border where illegal hunters may enter the park.
3. Proximity to main highways, large urban centers, and line of rail increase the threat of illegal wildlife trade due to urban demand for game meat and other wildlife products. CBNRM benefits need to be especially directed at those villages that might have contact with such illegal traffickers to encourage them to be vigilante and participate actively in CBNRM.
4. Protected forest areas adjacent to GMAs represent an important way of extending protection of wildlife resources, given than human settlements are not allowed in national forests. Extending the GMA boundary to include such protected areas would be an important way of increasing population range and reducing risks of local population extinction, especially where such GMAs are isolated or relatively small.
5. Higher maize producing areas both within and outside GMAs capable of producing a surplus should be specifically linked to balancing food shortages among communities living on less arable land in a GMA. Households often meet food shortfalls by exchanging fish or game meat with maize. Methods for improving food production, restricting settlements on poor soils, and providing family health services to families in need of family planning are alternative options for CBNRM.

6. Road access into a GMA for field staff support and facilitating community development needs is an important factor for CBNRM success. As such roads are improved, risks of illegal trafficking of wildlife meat in these areas also increase, thus requiring CBNRM vigilance of these roads. Hence, planning and development of roads in a CBNRM area should be undertaken with these concerns in mind.
7. GMAs approaching or exceeding 5000km2 are likely to be too large to manage effectively as a single CBNRM area. Furthermore, safari operators are not able to utilize the full extent of such concessions, resulting in lowered income per km2 as size of the CBNRM area increases. This results in a declining efficiency in maintaining acceptable standards for resource management. GMAs in this size class should preferably be divided into two hunting concessions corresponding to two separate CBNRM units. Alternatively, hunting leases for such areas to a given lease holder should be based on two hunting blocks with separate quotas and minimum kms of safari road distances.

B. Demographic and cultural factors

Population effects

1. CBNRM as an approach to natural resource management is likely to be non-viable for areas exceeding population densities approaching 5 – 10 people/km^2 due to land use pressures and disturbances that are difficult to regulate at a community level. In such cases, external interventions will be a more appropriate approach and may require greater reliance on national (or district) authorities if the particular area represents particular importance for the country's wildlife industry.
2. Population pressures on the natural resource base in a CBNRM area need pro-active planning by the community, as many of the changes that population increases bring are extremely difficult and expensive to reverse. One of the best ways for communities to do this is to build into the CBNRM program an annual land use planning process that engages a wide distribution of community leaders and stakeholders from each Village Area Group (VAG).
3. Where communities reside outside the boundary of the GMA, community vigilance of natural resources will be reduced and more exposed to external interferences. In such cases, CBNRM management should budget and plan for more strategically located camps or outposts for village scouts to operate from. Scout rotation at these camps will be necessary since schools and other social facilities will not allow families to live there.
4. Several key factors in reducing population conflicts on the resource base are 1) start land use planning discussions early in the CBNRM process, 2) build consensus at an early stage on what vision the community has for their wildlife and other natural resources, and 3) increase opportunities of employment from the resource sectors the community is helping to manage and protect. In this regard, safari hunting has serious limitations for job creation, given its specialized skills and low volume of tourists. Options for non-hunting tourism owned and managed can create a more positive attitude for communities to value their wildlife and the habitat requirements needed to sustain the resource.

Cultural relationships to CBNRM leadership

5. Positive response by members in a community to resource protection require effective CBNRM leadership in distributing resource derived benefits fairly among resident households according to needs identified by households living in a given VAG.
6. CBNRM leaders at the community level will be less susceptible to mismanaging funds and diverting benefits to their own village area if there are regular unit inspections and audits with executive authority by an external 'parent' institution to withhold community funds when irregularities do occur. Such visits should be done annually, or more often if done for training purposes, and costed in as a fixed CBNRM expense.
7. Accountability of projects identified at the VAG level should be reconciled with projects funded by the CRB to avoid projects that tie up community funds for projects that benefiting few (chief's palaces, vehicles, etc.). Guidelines on capital equipment purchased by the community should be reflected in the ADMADE Community Constitution.
8. Vehicles have become perceived as a status of ADMADE success without fully appreciating the inherent costs of maintaining and operating one. Less costly forms of transportation, particularly for resource management support, should be considered, such truck hiring for bulk tranport of patrol supplies and bicycles for intra-unit movement by scouts.

Settlement patterns

9. Spatial patterns of settlements that encourage fewer and larger settlements will favor CBNRM success. This is because wildlife habitats will be less fragmented and exposed to perimeter effects of land clearings and other human disturbances.
10. As traditional landowners and patrons of Community Resource Boards, local chiefs play and should be encouraged to play an important role in educating and influencing their subjects to reduce settlements in wildlife sensitive areas and help enforce land use plans that adopt zoning for settlements.
11. CBNRM-practicing communities having small, numerous, and highly scattered settlements will be less likely to coordinate CBNRM activities than communities occupying larger, few settlements. Compensatory steps should include regular visits and information exchanges among the VAGs.
12. Well designed development projects funded by CBNRM can reduce the effects of habitat fragmentation and habitat disturbances, especially if such projects are linked to community land use plans that reduce the need for local resident to degrade their resource base. Key variables in most GMAs that should be considered in this regard are water security and reduced conflict at waterholes, food security needs, and alternative sources of income to reduce pressures on game meat.

Number of traditional rulers in a CBNRM area

13. As the number of local chiefs in a given CBNRM area increase, the likelihood of certain problems affecting CBNRM success will also increase. These problems relate to decision-making, costs and coordination of activities. In these cases it may be necessary to develop a higher CBNRM authority to deal with land management issues while providing greater autonomy to individual chief's areas in meeting development needs.

Community skills and education

14. By having elevated educational standards and a genuine democratic selection process for members of the Community Resource Board, this statutory body will be more capable of applying CBNRM methods and skills to support resource management, financial management and community development in their area.
15. Women's roles on the Community Resource Board will likely be under-represented due to lower educational levels and not having qualified women to contest in the CRB elections. Absence of women on the Board for this reason may require ex-officio status and an increased effort to formally educate women in the community for them to effectively participate in CBNRM.
16. CBNRM success will be directly dependent on the level of training that participants receive to administer CBNRM in their areas. Curriculum for this training will necessarily have to adapt to changing needs and priorities communities have. This requires an integrated approach to linking curriculum development to CBNRM program monitoring.
17. The primary objective of village scouts is to balance the need for local employment to discourage poaching with the need to attract more educated people to learn and apply advanced wildlife management skills. A secondary role is to disseminate information and understanding about CBNRM to members in the community. It is therefore important to sustain the largest number of village scouts possible to maximize their overall impact on CBNRM success.
18. Village scouts have provided a 2.7-fold increase in scout manpower to GMAs at .3 to .5 the salary cost of GRZ scouts as well as a lower rate of absenteeism and replacement than GRZ scouts. CBNRM success is critically dependent on the further development and support of expanding village scout numbers in GMAs.
19. A continued advanced training program for village scouts has broadened the technical capacity of the community to manage their natural resources. Having advanced trained village scouts to perform certain tasks has greatly reduced the cost of data acquisition for such management functions as quota setting, land use planning and community education.
20. Village scouts provide a culturally acceptable route for dissemination of civic education to improve CBNRM understanding.
21. Substantial revenue loss to CBNRM is being avoided by having village scouts guard against fraud in licensing and under-reporting wounded animals.
22. Unit Leaders and their deputies provide a critically important source of CBNRM leadership throughout the year as resident CBNRM practitioners in the community. Annual training courses in CBNRM

methodologies have enabled unit leaders to broaden public support and understanding in ADMADE. Key to their success is financial support from WCRF for the wildlife management budget approved by the community and a supportive relationship with their Command Wardens.

C. Private sector

1. Development of hunting roads is a necessary investment by the private sector to increase hunting opportunities for safari clients and encourage community efforts to police wildlife depleted areas to increase wildlife revenues on their lands.
2. Safari operators will be less likely to develop hunting roads if the concession area exceeds a certain size, approximately 1500 – 2500 km^2 for lease periods that are less than 5 years. For this reason, size of concession areas and lease periods are important considerations when developing lease requirements for improving industry performance in a hunting concession.
3. To avoid illegal trafficking of wildlife products, hunting roads should not encourage access into the hunting area, especially from nearby urban areas.
4. The basis for a strong and profitable partnership between the operator and the local community is for each to complement the other with their respective strengths and capacities to produce more wildlife 'products' for the commercial markets. A key constraint for communities to play this role has been revenues to support these efforts have not been flowing effectively to communities in a manner that allows such funds to support budgets and annual workplans.
5. Failure to support CBNRM efforts within the limits of revenues earned has caused staff morale to suffer, patrol days to reduce, and groups size on patrols to decline. Such problems may have increased the incidence of corrupt practices by scouts and their unit leaders in certain areas.
6. As private sector partners to the wildlife industry, the community through a CBNRM process can provide a reliable and cost-effective way of protecting wildlife resources. This is possible if funds are returned to the local CBNRM authorities to support such costs, annual workplans support quarterly management steps to support patrol requirements, and expenditures for these requirements are regularly audited.
7. Monitoring of lease agreements is an important way of evaluating relative performance of individual operators in meeting industry standards and supporting the objectives of CBNRM. The 'Conservation Bullet Award' is a useful tool for this purpose and requires annual commitment by ZAWA to maintain its rigor and comprehensiveness.
8. Strictly on a percentage basis, communities appear relatively disadvantaged by being heavily taxed for producing wildlife (62.5% on licenses and 25% on concession fees). Given the added responsibilities and costs communities are burdened with to reduce poaching and land use disturbances, the industry would be better supported by imposing less deductions on community shares to encourage increased wildlife production.

D. ADMADE policy variables

1. ADMADE's strength rests very much on the premise that it is an on-going experiment of ideas and methods for building community commitment to wildlife conservation. As new lessons are learned and CBNRM methods improved, there is need for policy frameworks to also evolve in order to reinforce Government's commitment as a co-management partner with local communities.
2. Policy adjustments and continual institutional over-sight for program strengthening are critically required by Government to ensure lessons from ADMADE can be effectively applied in communal wildlife areas.
3. Key CBNRM variables that remain in the balance and require full attention by Government to make the most informed decisions for ways to strengthen ADMADE are as follows: 1) procedures of banking and disbursing community revenues, 2) revenue shares entitled to communities, 3) special licenses, 4) tendering procedures for leasing hunting concessions, 5) protecting land tenure for communities, and 6) extending ADMADE policy to encompass other resource sectors.

E. Donor relationship to CBNRM development and support

1. 75% of the non-donor funded GMAs that had a wildlife industry when the ADMADE program was introduced have subsequently lost their industry. As a result, there has been a total loss of revenue support for the local communities in these areas. In contrast, in all the areas originally provided with

capital start-up support by donor assistance, all remain with private sector commitment and all are tendered competitively by the private sector. It is therefore strongly recommended the same level and conditions of capital start-up support be provided to those still without basic capital equipment to promote the CBNRM approach.

2. Donor support for CBNRM activities in a communal wildlife area should be limited to 1) a one-off equipment investment to provide the means for wildlife production to increase, 2) skills development to manage the resource as well as to gain increased profits and employment opportunities, and 3) assistance to key land use initiatives that demonstrate communities' determination to live sustainably with their wildlife resources.
3. Key training needs in the more developed CBNRM areas is more advanced training in financial management and technical know-how on establishing community enterprises in the tourist sector as well as other business ventures.
4. Over-reliance on donor funds to implement CBNRM may diminish the perceived value of the resource and may also detract from local stewardship of the CBNRM process if donor funds necessitate external personnel to administer the initiative as opposed to local leadership.
5. Donor support to intermediary organizations or institutions for assuming this responsibility of implementing CBNRM will increase costs for rural development while delaying the growth of civic responsibilities by communities themselves for managing and developing their own natural resources.
6. Because of the complex and broad significance of CBNRM in Zambia, donor/government dialogue is essential to maintain program continuity and consistency of national values and aspirations.
7. Donors provide a helpful source of critical review for progress in CBNRM development as based on mutually agreed goals and objectives. Facilitating such dialogue will help promote continued donor support and interest in CBNRM development.

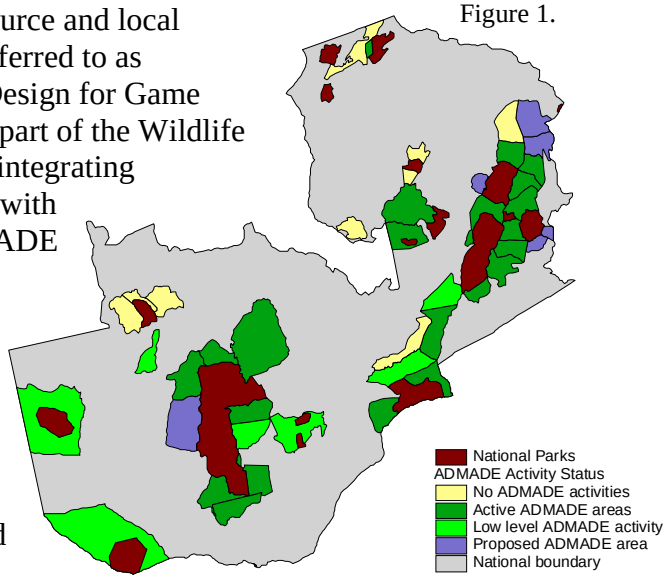
It is clear there are many levels of influence affecting ADMADE's success. This study has shown what cautionary steps are needed when dealing with different variables that are bio-geophysical, cultural or demographic in nature. The ability to respond to these variables are strongly influenced by the level of skills and quality of leadership communities have. Equally important are the policies that create the needed incentives for communities to be actively committed to the benefits CBNRM promises. Such interlocking dependencies are further complicated by the number of key players that contribute their respective influences on CBNRM success and their own abilities or desires to forge partnerships for the enhancement of CBNRM with other players.

As ADMADE continues to grow, such complexities and challenges will need to be more fully appreciated by the national leaders and planners of the CBNRM process in Zambia. Doing so will also require the constructive view that ADMADE is an imperfect, evolving program that is allowing all levels of ADMADE participation to question their respective roles in its success. If such a process is allowed to proceed, this paper has shown the enormous potential to conservation and rural development that can be achieved when communities do gain a sense of ownership and financial security from a resource their lands are capable of producing.

Introduction

The Government of Zambia has embarked on a wildlife conservation and development policy that decentralizes much of the resource management responsibility for areas surrounding national parks to locally elected community authorities, called Community Resource Boards. This policy has progressively evolved from a pilot study carried out in the mid-1980's and has subsequently undergone numerous transformations and adaptations in meeting the needs of both the resource and local community land owners. In 1999, this policy, referred to as ADMADE or the Administrative Management Design for Game Management Areas(GMAs), became an integral part of the Wildlife Act of Zambia, providing a legal framework for integrating communities into a co-management relationship with Government and private sector investors. ADMADE continues to be an evolving program, actively applying principles of adaptive management to identify, test and refine methodologies that support community-based natural resource management (CBNRM). The vast geographic extent of ADMADE activity (shown in Figure 1) provides host to a diverse set of interacting variables, including a varied megafauna, assorted cultural and demographic characteristics, and numerous geophysical features, that potentially influence ADMADE results for a given area. Most of Zambia's game management areas are at different stages of ADMADE activity with more than a third not yet implementing the policy. For this reason there is a practical and strategic need to identify and understand how different variables affect the likely success of CBNRM goals and activities in a given area.

Figure 1.



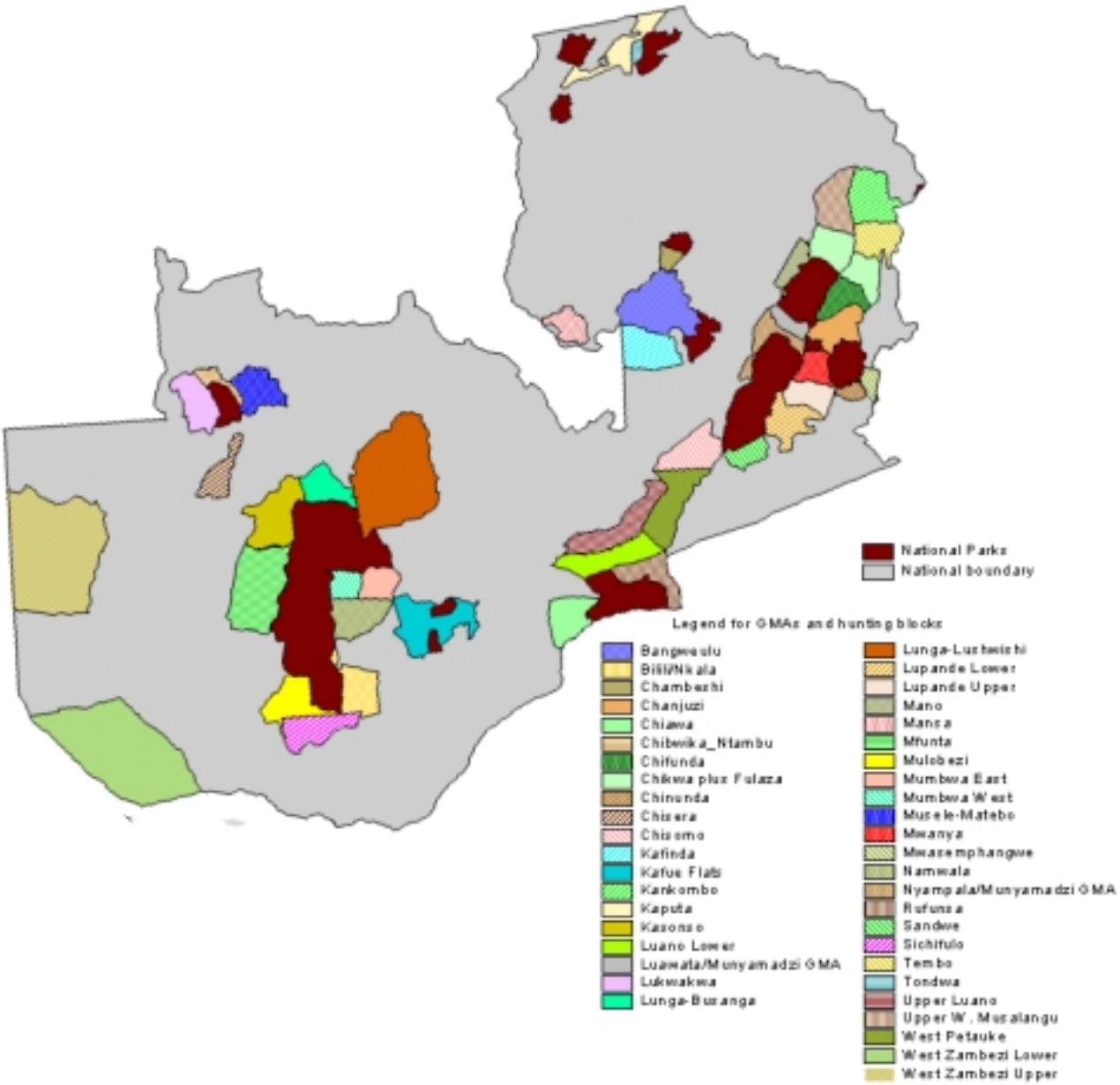
From such an analysis, additional questions can be asked as to how best to adapt ADMADE to these variables in achieving bio-diversity conservation, supporting community development needs, and promoting private sector profits. The past ten yeas of experience in the ADMADE program provide a rich set of comparative experiences to improve understanding on factors influencing CBNRM success in Zambia. This study attempts such an analysis to help synthesize key lessons that will help make the ADMADE approach more likely to succeed over the long-term as Government, together with its donor partners, plan for the program's future expansion and continued strengthening.

Objectives of analysis

The primary objective of this study is to generate a quantitative basis for planning and successfully implementing CBNRM in Zambia by building on the extensive knowledge acquired from ADMADE and other CBNRM activities in the country. In particular, the study examines how a set of variables common to most GMAs influence the efficacy of CBNRM approaches in achieving goals of resource conservation and rural development. Results of this study are organized into five broad sets of analyses:

1) Identification and analysis of environmental factors likely to influence an area's capacity to generate wildlife revenues for CBNRM activities. These factors are referred to as GMA 'environmental' variables.
2) Description of these variables for the different GMAs in Zambia.
3) An analysis of how these variables are impacting on CBNRM performance.
4) A comparison of these results with expected results from other resource management approaches
5) A synthesis of lessons learned for future strengthening of the ADMADE program

To facilitate the discussion of these results, the following map (Figure 2) provides the names of all GMAs (and proposed GMAs) in Zambia.



Analysis of the GMA 'Environment'

1. Bio-geophysical factors

ADMADE depends largely on local community leadership and participation to manage and protect wildlife and other natural resources around national parks on communally owned lands. These efforts are both supported and rewarded from revenues derived from the sustainable and commercial use of these resources. ADMADE has adopted a number of steps for converting these revenues into resource management support and community development. Each step relies on local skills in terms of how communities receive and manage funds, their capacity to identify households needs that may contribute to resource degradation, their managerial skills in implementing projects that meet these needs, and so forth.

Underlying this process are bio-geophysical features that may limit how much income a given area can generate from its biodiversity and relate to the geographical location of an area as well as the particular ecological or geological characteristics of the area itself. If such factors constrain sustainable income, then revenues may be too low to sufficiently motivate local households to adopt ecologically viable land use practices. In these cases the likelihood of ADMADE's success will be weakened.

Variables and general concepts

Some of the bio-geophysical variables that may influence ADMADE success used in this analysis were as follows:

1) Proximity to major roads linking GMAs to urban markets.
   Major roads currently provide easy access to urban markets for illegal game meat, charcoal and other renewable resources. Without controls, the high volume of commercial traffic on these roads help diminish resource production in a GMA.
2) Proximity to urban centers that impose resource use demands on nearby GMAs
   GMAs located relatively close to urban centers will be at greater risk of resource degradation from unsustainable exploitation and commerce of natural resources.
3) Availability of natural watering sites for wildlife throughout the year
   Availability and distribution of watering sites, including perennial water holes and perennial streams, influence the carrying capacity of most species of wildlife occurring in GMAs
4) Boundary effects with protected or semi-protected areas for restocking wildlife in GMAs
   Most CBNRM areas practice consumptive wildlife management and have a shared border with a protected or semi-protected areas thus providing a reservoir of animals for restocking if cross-boundary wildlife crossings are unimpeded.
5) Year-round secondary road access into GMAs for supplying management staff and local residents with commodities and supplies.
   Road access into a GMA increases the chances that management staff will be provisioned to carry out their duties during critical wet season months when illegal hunting is most common. Road access also enables critical commodities to reach local residents in bulk, thus reducing living costs and risks of food shortages that might otherwise be mitigated by increased pressures on wildlife.

6) Species available in a GMA, their market value, and population sizes. Species present in a GMA represent the resource capital ADMADE ultimately depends on to derive most of its income, which is dependent on their respective market value and the number of animals on sustainable hunting quotas.
7) Area of a GMA. Spatial extent of a GMA contributes a variety of influences on ADMADE success. The smaller an area the more easy and cost-effective it is to manage the area's resource use activities. However, if a GMA is too small, its own area may not be able to sustain a commercially viable hunting quota unless adjacent areas provide a source of animals for restocking. Conversely, an area too large may suffer inefficiency under a single administration for coordinating and implementing CBNRM.
8) Suitability of soils. Soils are an important determinant to competing land uses. In cases where soils are suitable for farming, wildlife and other natural resource may be threatened by growing pressures of agricultural activities. On the other hand, limited arable soils tend to create food shortages among resident communities, and as a result, households are forced to over-exploit wildlife as a commodity to barter for maize.

Urban area and roads

Figures 3 - 8 are national maps describing urban population centres, major road networks, GMA boundary effects, and biodiversity and population characteristics based on quota statistics. One general conclusion these maps suggest is that there is considerable variation in potential risk that GMAs are exposed to in terms of how these variables may be influencing ADMADE success. The elliptic circles in Figures 3 and 4 suggest those GMAs most vulnerable to urban pressures because of proximity to major roads and highly populated urban areas. Not surprisingly, the GMAs most vulnerable to the effects of urban centres are also the same most vulnerable to major roads.

Figure 3. Urban centres

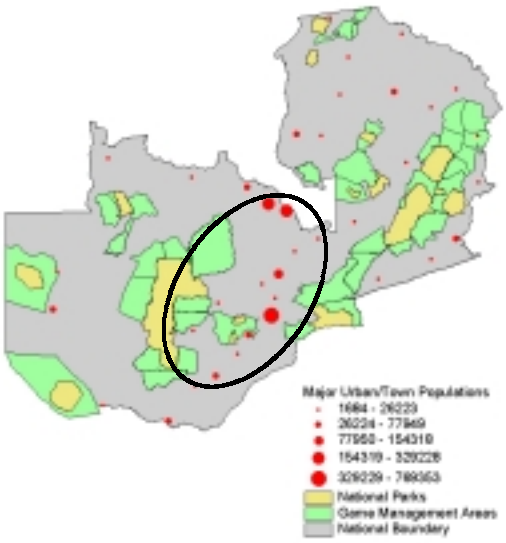


Figure 4. Major roads

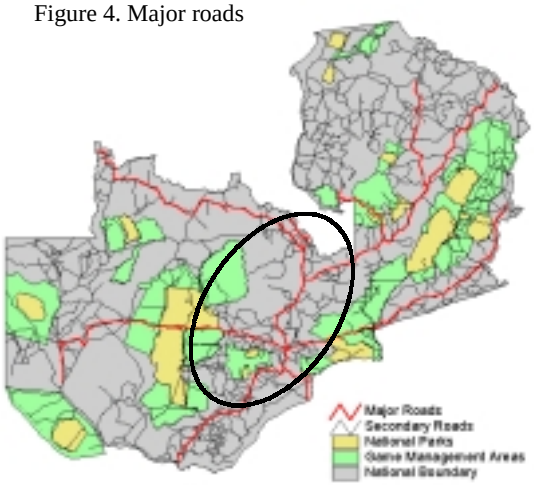
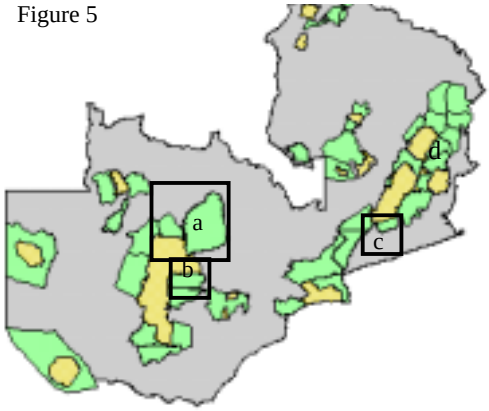


Figure 5



Boundary effects

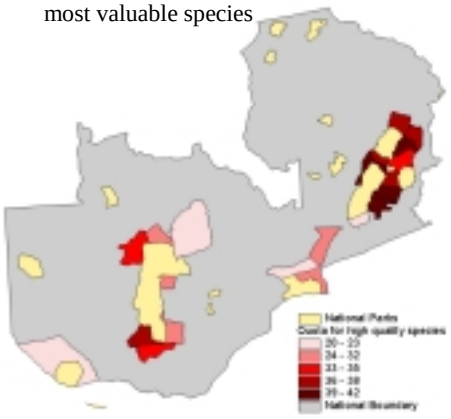
Figure 5 presents a variety of boundary effects on restocking rates from national park reservoirs, highlighted by elliptic and square outlines. In case 'a', the park boundary with Lunga-Lushwishi GMA consists of two deep rivers that impede the free movement of animals into the GMA. Case 'b', affecting Mumbwa and Namwala GMA is similar, except the northern boundary of Mumbwa is adjacent to a relatively small section of the park, which is also cut off from the main park by a deep, impassable river. In all three of these GMAs, buffalo numbers have declined over the past decade. Buffalo is a species much preferred by both legal and illegal hunters. Without access to a protected area capable of supporting a safe reservoir of buffalo, these areas may not be able to sustain their own herds by natural recruitment from losses attributed to hunting and poaching. Chiawa GMA, which is among those vulnerable to proximity effects of major roads and urban centres, is also isolated from the national park adjacent to its boundary by a deep river. It too has critically low numbers of buffalo.

In case 'c', depicting Sandwe GMA, its relatively small area shares much of its boundary with South Luangwa National Park but animal movements across the park boundary are impeded by a major river, which animals can cross only seasonally, and by escarpment hills. Case 'd' is a generalized problem in much of Luangwa Valley where many GMAs share a border with either the South or North Park. Though the Luangwa River represents only a partial barrier to most wildlife species, local residents typically construct fishing camps and actively fish along the river during the dry season when the river is most easily crossed by wildlife. This human activity increases the barrier effect the Luangwa River has on wildlife, especially for those species sensitive to human presence.

Biodiversity effects

Figures 6 – 8 examine some of the possible effects of wildlife biodiversity and population abundance on ADMADE success. Figure 6 illustrates a measure of variation in economic value for key wildlife species that occur in GMAs currently being hunted by safari clients. This measure is based on the total number of animals on safari hunting quota for the 7 most valuable species sold to overseas safari clients (excluding the wetland species found only in specialized habitats): lion, leopard, eland, buffalo, hippo, roan and sable. In particular, buffalo, lion and sable are among the most popular species sought by safari clients.

Figure 6. Total quota for the 7 most valuable species



GMAs with the lowest values tend to be those nearest towns, major roads, or relatively isolated from a park in terms of boundary effects on wildlife crossings. This pattern was not simply a function of total huntable species on quota, as is suggested in Figure 7, which illustrates total species on quota for each GMA. Unlike the previous figure, Figure 7 shows species numbers allowed on quota were relatively high for those GMAs having relative low economic value from the prime safari species. Figure 8 shows variation in total number of animals on quota among the hunting areas. Lowest scoring areas again are those nearest urban centres, near major paved roads or with limited access to wildlife border crossings with an adjacent national park.

Figure 7. Total species on quota

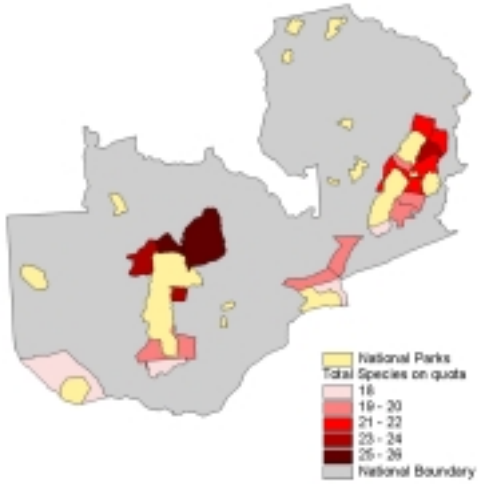


Figure 8. Total animals on quota

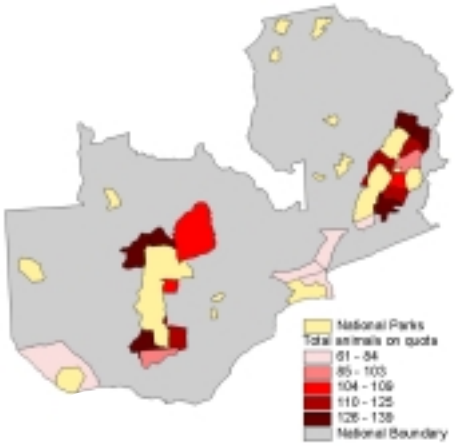
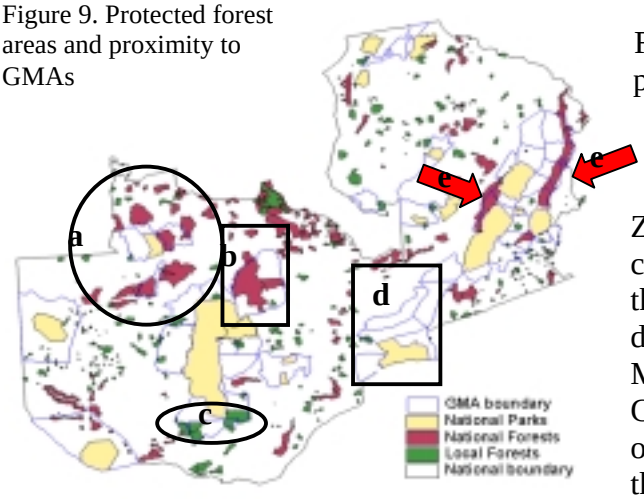


Figure 9. Protected forest areas and proximity to GMAs



Protected forests

Figure 9 illustrates the locations of protected forest areas in relation to game management areas and various threats and opportunities that exist within the various matrix of situations that occur in Zambia. In ***Area a***, there is a high concentration of protected forested areas that either overlap or border with 4 different GMAs (Chisera, Lukwakwa, Musele-Matebo, and Chibwika-Ntambu). Given their relative isolation in terms of only one small national park that borders three of the GMAs, there exists the opportunity of significantly adding to the range of managed wildlife areas by consolidating these forest areas as part of these GMAs. This would increase the total area of the GMAs from 11,236km^2 to 20,050km^2 and would also give increased protected status to wildlife since settlements are not allowed in protected forests.

In ***Areas b and c***, four of the major GMAs surrounding Kafue National Park have significant areas gazetted as either national forests (Lunga-Lushwishi) or local forest (Mulobezi, Sichifulo, and Bilili). Those located in Mulobezi and Sichifulo extend well beyond the GMA boundaries and offer an opportunity to consolidate the two land classifications for increased protection for wildlife under ADMADE management. Increased wildlife revenues derived from a protected forest area would theoretically enhance the value of a forest by managing it as a wildlife protected ADMADE area. Lunga-Lushwishi has one of the largest protected forest areas contained in any GMA and with improved management and protection of this forest, wildlife production would likely increase as well, thus creating an economic synergy between the two respective resources.

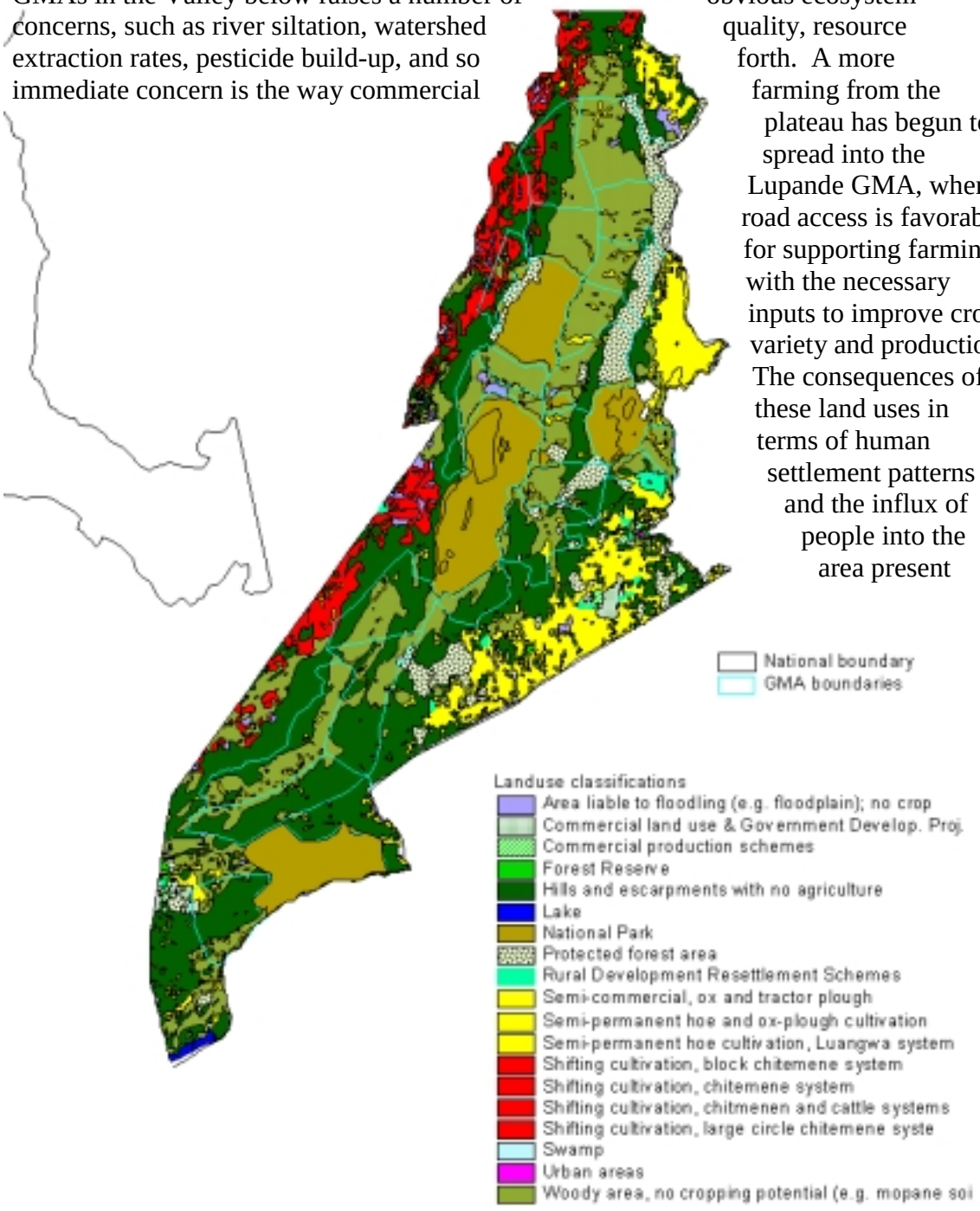
Area d represents a complete converse of ***Areas a,b,and c*** by having a near total absence of protected forest areas. Moreover, these GMAs (Chiawa, Luano Upper and Lower, and Rufunsa) are located near Lusaka and have major roadways passing near or along their borders. All four GMAs are sources of large scale, unregulated charcoal production for the Lusaka and outerlying markets. This situation represents a serious threat to these areas as continued charcoal exploitation slowly erodes prime wildlife habitat in the effected areas and attracts increased settlements to a potentially lucrative but destructive land use practice.

Areas e, pointed to by the large red arrows, are protected forests representing important watersheds along the escarpment hills of Luangwa Valley. They also overlap with about half of the GMAs in the Valley and represent an important ecological function of recharging the water table that feeds into the Valley below. Management of these areas and other surrounding forests should be a long-term concern for maintaining permanent water holes for wildlife populations if the Luangwa Valley is to remain the core of Zambia's wildlife tourism industry.

Soil suitability

Figure 10, shown on the following page, is a land use soil suitability map for the Eastern Province and includes portions of the Northern and Lusaka Provinces. A total of 22 potential ADMADE areas (existing ones and those being proposed or requested among resident communities) are over-laid on this map. Within the extent of these GMAs, less than 6% of the total land area is arable and suitable for farming. Much of the land area is either hilly and rocky or characterized by valley clay soils not easily plowed and subject to water-logging.. The arable land is primarily along river or stream drainages having alluvial deposits with relatively fertile, tillable soils. These soils are quite restricted and provide the mainstay for food production among resident communities. As populations expand over time, families are forced into less arable land along the fringes. These soils tend to be heavier in clays and food production is significantly less, forcing many households to supplement food production with game meat as a commodity to exchange for maize or sorghum with their more successful neighbors farming on better soils. Access to ground water also tends to be reduced on these clay soils and households often have to compete for the same waterholes used by wildlife. These conflicts and limitations of soil fertility in Luangwa Valley are a major challenge for ADMADE in this region and pose a serious threat for the sustainability of wildlife in Luangwa Valley.

Beyond the escarpment perimeter of the Valley on the plateau above (see Figure 10 below), the availability of arable land is dramatically improved, particularly in the Eastern Province. It is no surprise that this area of Zambia is becoming a major producer of maize and cash crops (e.g. cotton and tobacco) for Zambia with parallel increases in human populations. The impact such land use pressures may be having on the existing GMAs in the Valley below raises a number of obvious ecosystem concerns, such as river siltation, watershed quality, resource extraction rates, pesticide build-up, and so forth. A more immediate concern is the way commercial farming from the plateau has begun to spread into the Lupande GMA, where road access is favorable for supporting farming with the necessary inputs to improve crop variety and production. The consequences of these land uses in terms of human settlement patterns and the influx of people into the area present



serious challenges for CBNRM, and wildlife in particular. Similar pressures are being experiences among the two proposed GMAs, Mwasemphangwe and Chinunda, whose

areas provide a potential link between Kasungu National Park in Malawi and Lukusuzi National Park in Zambia.

Summary of variables

Table 1 lists the environmental variables for the different GMAs examined in this study. These include the actual area of the hunting block, boundary effects with adjacent GMAs and national parks, proximity effects to town centres, number of months the area can be accessed by a 4-wheel-drive vehicle, and total distance of rivers that contain water throughout the year.

HBlockName	Area (km2)	Boundary Value	Town Factor	Road access	Water holes	Rivers (km)	High value quota	Total quota
Bilili/Nkala	400	376	126.8	7	10	96	32	125
Chanjuzi	2555	404.2	75.2	11	20	32	33	101
Chifunda	2104	1143.5	95.2	10	25	87	40	117
Chikwa plus Fulaza	5051	225.1	84.9	11	34	255	36	139
Kasonso	4592	299.1	91.6	12		287	35	130
Luano Lower	4901	88	4158	9			20	61
Lunga-Busanga	2094	322	17.2	9	1	133	29	130
Lunga-Lushwishi	13323	32	1197.2	9	6	682	23	108
Mulobezi	3573	460.1	320.8	9	6	0	38	129
Mumbwa West	1580	175.5	305.9	12	14	56	31	108
Luawata	1284	1206.2	171.7	6	3	126	37	116
Nyampala	1893	2615.3	171.7	6	5	201	39	121
Mwanya	1587	704.2	256.5	10	18	48	36	109
Rufunsa	3180	718	4092.3	12	8	76	31	79
Sandwe	1492	673	84.9	9	9	62	23	80
Sichifulo	3478	190.5	393.6	12	7	0	35	103
West Petauke	4354	82	50.9	8	11		30	84

Boundary effects were defined as the potential benefit adjacent parks and GMAs may have on restocking a given GMA. Its value, referred to as 'Boundary Value', was based on the following equation:

Boundary Value = ((A-B)*log(C)*D) + (F-G), where

a) A=km shared boundary between given GMA and national park
b) B=km of this shared boundary not passable by wildlife
c) C=km2 of national park accessible to GMA
d) D=wildlife abundance factor of the national park (scaled from 0 to 1, values given subjectively based on authors experience and anecdotal information available)
e) F=km shared boundary with adjacent GMA
f) G=km of shared GMA boundary not passable by wildlife.

Proximity effects to town centres were defined as the possible influence urban centres may have on illegal game meat marketing as a function of distance to a town centre and its urban population. Population data were based on 1990 Zambian census data. Referred to as 'Town Factor', these effects were calculated by dividing the population of

a town by the road distance from the urban centre to the centre of a GMA. Selection of town was based on the largest urban population as long as its road distance was less than 300 km.

Possible influence of these variables is shown in the graphs below:

Figure 11

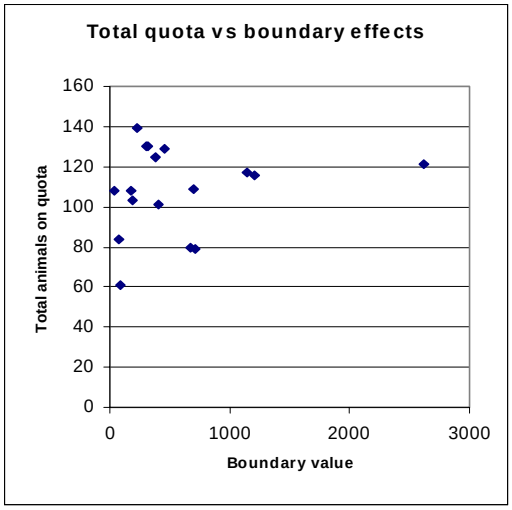
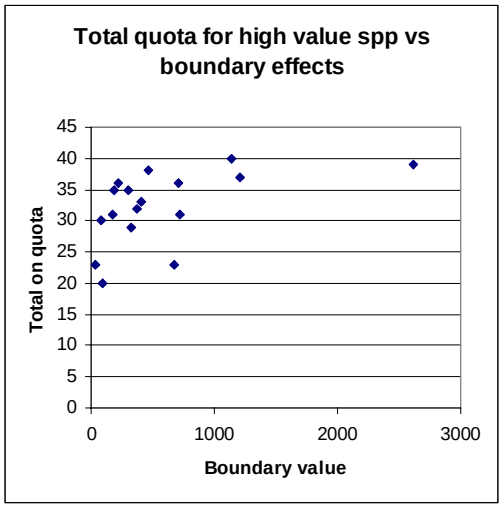


Figure 12



Total animals on quota (Figure 11) were not influenced by boundary effects of protected lands adjacent to a GMA, possibly because most species on quota do not have large ranges and infrequently cross between the two areas. In contrast, Figure 12 suggested higher value, larger body species (buffalo, hippo, lion, leopard, roan, sable, eland) are more likely to maintain larger populations when their range is adjacent to a national park or game management area. Given that these species are generally low density (with the exception of buffalo and hippo) and in relatively high demand, this conclusion is not surprising, if over the history of safari hunting in Zambia the effects of hunting in GMAs have tended to lower populations. Since these species tend to range further than smaller species, the possible effects of parks as a reservoir for restocking would more likely be beneficial to these species, as the graph suggests, while also suggesting the possibility of historical over-hunting.

Figure 13 shows a possible inverse relationship between hunting quotas and proximity to town centres. This relationship is presumed to be caused by the higher rates of illegal game meat trafficking from those areas closest to major urban areas, as was also suggested in Figure 8. This situation underlies the critical importance of having a legal market that out-competes illegal ones in terms of benefits derived for the local community. If the benefits of the wildlife industry are not substantial enough to benefit households in the community, risks of illegal trafficking will likely increase among those areas within commercial range of urban areas. This problem will undoubtedly worsen

Figure 13

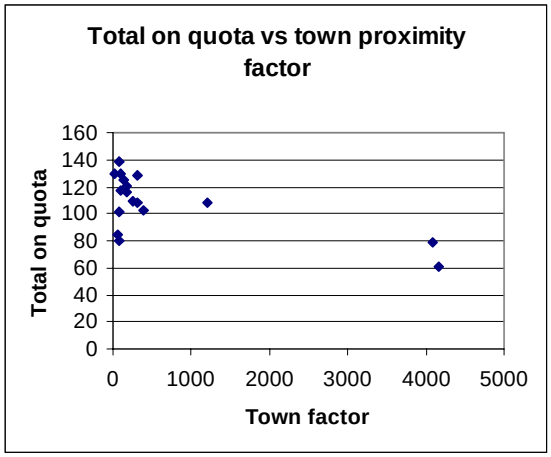
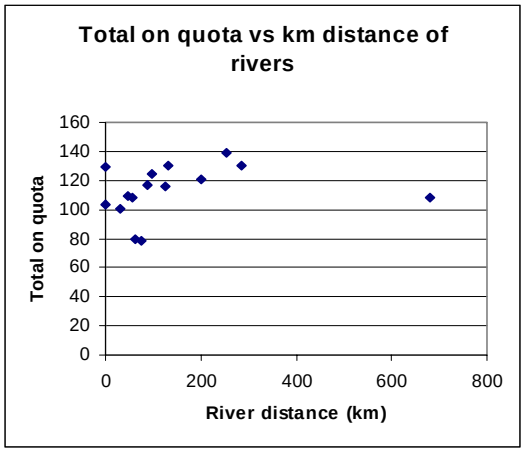


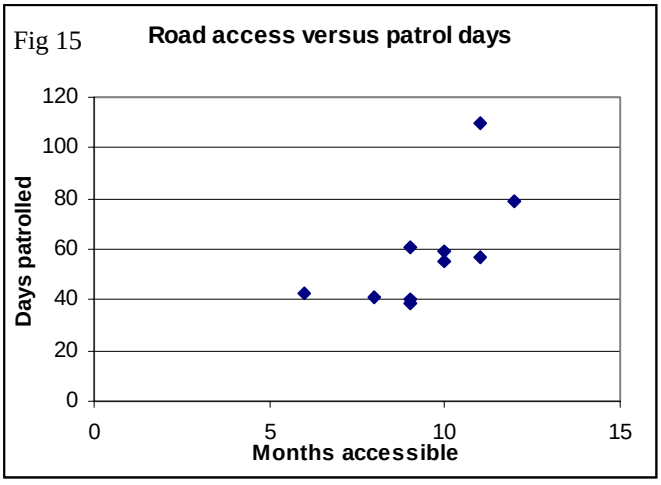
Figure 14



as urban areas grow and road access improves. Associated with this relationship to urban proximity is the network of paved highways that lead to Zambia's larger towns and cities and that help facilitate the movement of game meat on these commercial routes. Another conduit for game meat is by rail and is especially relevant to Sichifulo and Mulobezi GMAs where the train linking these areas with Livingstone has become a major supplier of illegal game meat to Livingstone.

Though the number of waterholes did not show any relationship to quota size, Figure 14 suggests quotas or total population sizes for hunted species are positively related to total rivers distance having water throughout the year. Basic road infrastructure that facilitates management operations in a GMA may also be a factor influencing ADMADE success, especially in terms of year-round access for supporting patrol requirements, dispatching poachers when they are arrested, facilitating completion of community projects and so forth. This relationship was tested in Figure 15 by relating the number of months a 4-wheel drive vehicle can reach the unit HQ throughout the year to total number of days scouts went on patrol during the wet season months of January to May, averaged for 1998 and 1999. As might be expected, those units with poor access tended to have fewer days of patrolling during the wet season, suggesting greater difficulty in preparing for wet season patrol requirements.

Fig 15



Somewhat surprising was the result that size of the hunting area did not correlate with quota size or ADMADE income (based on 1998 safari hunting season, see Figure 16). In contrast, Figure 17 shows a clear relationship between total quota size among all hunted areas in Zambia and their expected revenues based on individual species' license values. The fact that area of the hunting concession did not influence quota size suggested at least two

possible reasons, each with important implications for CBNRM success. First, from a management perspective, areas that exceed a certain size become increasingly difficult to patrol and police due to a disproportionately higher cost of maintaining and supervising increased number of scouts as the size of the area increases. This is especially true if income levels do not correlate with concession areas. It therefore follows that as the size of an ADMADE or CBNRM unit increases, it becomes increasingly difficult to maintain adequate levels of law enforcement and resource protection. As a result the overall quality of the area in terms of available trophy animals on quota will likely decline.

Another likely explanation is that a single safari operator having a relatively large hunting concession will be less likely to hunt the entire areas unless hunting roads cover the full extent of the concession. This is particularly true if lease periods are too short for operators to see a return on an investment to improve hunting roads. This factor will be treated separately under the section, 'private sector variable'.

Figure 16

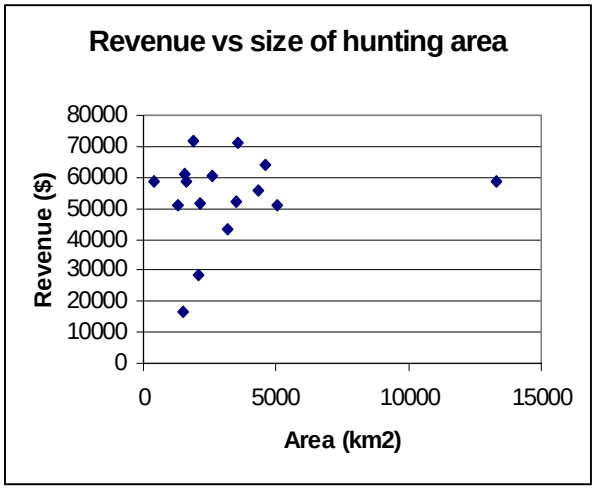
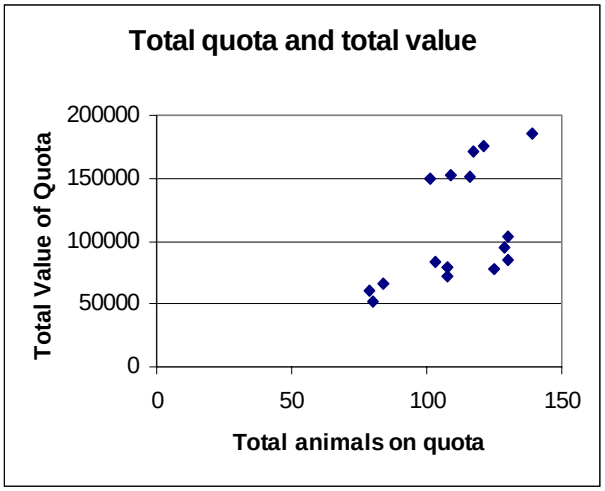


Figure 17



Conclusion: impact on CBNRM performance

1. Wildlife CBNRM areas isolated from any adjacent protected area, particularly large, well stocked national parks, are at much greater risk of having sustainable hunting quotas too low to support economic incentives for managing wildlife as a land use. Unless non-consumptive options exist to produce comparable wildlife revenues (e.g. Chiawa), CBNRM will have much greater difficulty in succeeding. While the exact effects on wildlife crossings caused by different geophysical features are not well understood, it is safe to conclude that deep rivers, high escarpment hills, and well-settled zones impede the free movement of animals to and from more protected wildlife areas. Such effects need to be appreciated in the CBNRM planning process in order to take necessary precautions for those species most effected, primarily the larger and more valuable species. Otherwise the cost of restocking species once locally extinct will likely be prohibitive for most communities and their private sector partners. This problem is particularly relevant for Chiawa, Mansa and Chizera areas, which are almost totally isolated and lack the key species needed to support the higher paying classical safaris.

Boundary effects are also becoming more apparent for even those areas adjacent to national parks where the parks themselves are small or have suffered a recent history of heavy poaching with severely depleted wildlife stocks. In these cases, the CBNRM process must be extremely conservative on setting hunting quotas to ensure the critical economic species are not over-hunted. This is especially relevant for Mumbwa, Lunga-Lushwishi, Lunga-Busanga, Kasonso, and Mwasemphangwe. Even areas with favorable crossing opportunities for certain species on one side of the GMA may not offer any added cushion for restocking species found only in regions on the opposite side where border effects may be less favorable. Many of the Valley areas face this problem for hartebeest, roan and eland, and in certain areas (e.g. Upper Lupande) roan and possibly hartebeest have become essentially extinct.

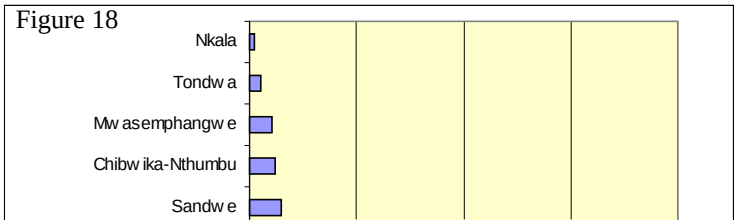
2. In such cases where GMA's are isolated and where ADMADE has been introduced, extending GMA boundaries to enclose protected forest areas, should they exist (as they do for Chizera, Mutele-Matebu, Lukwakwa, and Chibwika-Ntambu), could be an important option. Increased protected land areas will reduce risks of population extinction if portions of the contiguous area can be more extensively protected to ensure certain core wildlife populations provide a reserve of breeding stock. Since human settlements are not allowed on national forests, including such forests as part of a GMA would make this option viable.

3. Agricultural build-up in surrounding regions may create increased markets for illegal game meat, especially if CBNRM areas are unable to produce sufficient food for themselves and local residents use game meat to exchange for maize. This imbalance of food security will lessen the likelihood of CBNRM success since wildlife will be used as an exchangeable commodity instead of supporting the much higher commercial markets of wildlife tourism .

An appropriate CBNRM approach to this problem might be to use ADMADE funds to purchase maize from the high maize communities able to produce a surplus to meet the food shortfalls that cause local famines in wildlife rich ADMADE areas. In exchange, maize producing areas will find a ready market for their produce and may come to realize the advantage of not encouraging residents to exploit wildlife illegally in ADMADE areas where their maize markets are supported by revenues derived legally from wildlife.

4. Size of an area may be an important factor for achieving CBNRM success if there is an upper limit for the size of an area that a single operator can effectively utilize. Similarly, management efficiency in monitoring and policing wildlife as a single CBNRM unit may decline beyond a certain size limit of the area, especially if revenues needed to support wildlife protection does increase in proportion to the size of the area. Figure 18 below shows the distribution of concession size for Zambia's GMAs. Results presented in Figure 16 suggest that those concessions that approach or exceed 5000km2 are too large and need to be divided into two smaller concessions, each with their own respective CBNRM management and administration. The concessions that this recommendation applies to are Upper and Lower Zambezi areas, Lunga-Lushwishi, Lower Luano and Chikwa-Fulaza. The less favorable portions of the two sub-divisions will likely require different tendering arrangements to favor more private sector investment.

Figure 18



2. Demographic and cultural environmental factors

GMAs show a range of variation in how human populations have settled in and around these areas. Such variation represents an interesting pattern of human contact with renewable resources as well as effects on CBNRM success. Within these populations, there also exists considerable variation in social characteristics that are likely to influence CBNRM's effectiveness in building local consensus and commitment to ecologically sustainable land use practices.

Variables and general concepts

Some of these factors considered in this study were:

1) Human population size of community land owners of a GMA
   Local support for CBNRM as a land use that complements more conventional land uses depends on the level of benefit individual households realize from CBNRM activities in their area. As populations increase, the level of CBNRM benefits is likely to decrease. Competing land use options that may threaten CBNRM objectives are also likely to increase as populations grow.
2) Human populations residing within a GMA
   Human ownership of a resource presupposes a certain level of responsibility for it. In this regard, communities that live close to the resource and adhere to good land use practices may provide a certain level of custodial protection over their land and resources. More remotely settled landowners might be expected to be less involved in the management and protection of their resource and thus lower the chances of CBNRM success for that area.
3) Population growth trends
   Population age structure for a resident GMA community provides a basis for predicting future growth in the population. Current scenarios of population pressures as a threat to CBNRM objectives in some ADMADE areas suggest limits are already being reached. If human populations exceed resource limits, then meeting human needs through sustainable land use will be improbable. Once such limits have been reached, chances for CBNRM success are reduced and more draconian measures that depend on more external interventions are likely to be required. For this reason, CBNRM practitioners should make this issue a highly visible one for continued community discussions and education.
4) Fragmentation of human settlements in a GMA
   The more fragmented settlements are in a GMA, the greater the difficulty local leadership may have in coordinating CBNRM activities, disseminating information, and reaching consensus on decisions that improve resource production and community needs. In addition, the more scattered communities are, the more difficult it becomes for capital projects (e.g. schools) to benefit all households. As communities become more fragmented and scattered, it also becomes more difficult to monitor their land use and effects on revenue production.

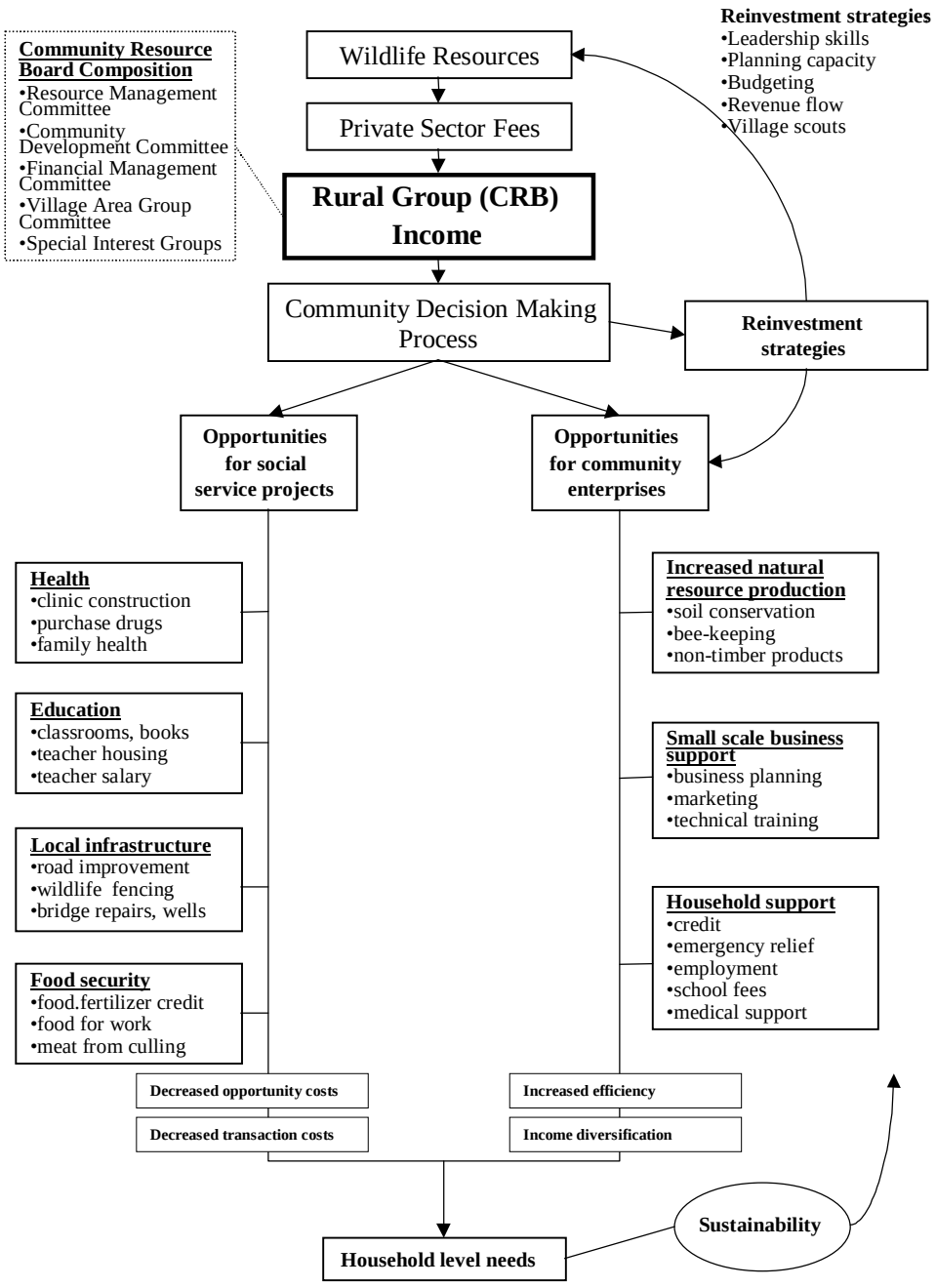
5) Number of traditional leaders associated with a GMA
   Increased number of traditional leaders are likely to increase the difficulty in reaching consensus among local leaders in coordinating a more united support for CBNRM objectives and procedures.
6) Level of skills available within the community for administering and implementing CBNRM.
   The level of skills acquired by CBNRM leaders in the community will improve the sustainability and long-term success of ADMADE.

The basis for improving local living standards in the ADMADE program has historically been to channel 35% of the total revenue collected by the Wildlife Conservation

Revolving Fund (WCRF) through a locally administered leadership authority, called the Wildlife Management Sub-authority and chaired by the local Traditional Ruler. This structure was based on the assumption that ADMADE should not attempt to alter existing leadership structures in a village community but rather strengthen existing ones, realizing that powers of the Traditional Rulers could be exceedingly important in unifying communities around the ADMADE concept of sustainable development. In practice, the Royal Families, who often dominated the decisions made by the sub-authority, to a large extent controlled the benefits funded by its 35% share. As was predicted, however, Traditional Rulers did in fact make a number of important contributions in resolving land use conflicts, most especially village encroachment in wildlife sensitive areas.

Despite efforts to monitor the use of this 35% share and facilitate numerous workshops to more equitably distribute its potential benefits for all households, the problem continued. A national consensus was carried out to review this problem and develop a new design that would allow a more accountable flow of ADMADE benefits to all members of the community. What emerged from this process was a new leadership design that was based on a democratically elected Community Resource Board having executive powers and responsibilities for promoting the ADMADE objectives of resource management and community development. In particular it required ADMADE revenues to be fairly distributed in the community according to Village Area Groups (or VAGs). It also required that these Boards be democratically represented by residents of these VAGs and that Traditional Rulers be Patrons to the Boards to provide oversight and advice. Figure 19 below provides a description as to how this new ADMADE design is expected to work.

Fig. 19. ADMADE Framework: Impact on Household Needs



Efforts are currently underway to facilitate the election of these CRBs, provide necessary skills to the newly elected members, and introduce new financial controls and procedures for how funds will be administered. As these changes are put into place, past lessons into how demography and social factors can influence CBNRM results are presented below to help guide these new initiatives as part of the restructuring of ADMADE.

Population size effects

Population size of a community residing in a CBNRM area will likely lower chances of CBNRM success if it 1) contributes to a decline in per capita benefits, 2) increases resource use conflicts, and 3) increases the difficulty in administering CBNRM for community-wide participation and acceptance. This will more likely occur as populations grow and exceed certain manageable limits for CBNRM to succeed. Likewise, if a community is too small or is not physically living in the area where the resource is managed, chances for CBNRM success may also be reduced. As an 'absent land owner' the community may not be physically present to protect the resource from outside disturbances. If community members reside elsewhere and practice a different land use (e.g. livestock), wildlife may be considered irrelevant to their primary source of livelihood.

The Lozi tradition provides a CBNRM solution to this problem. The Litunga (or the Paramount Lozi Chief) settles well trusted headmen together with their villages in areas where specific natural resources need protection and where there is an absence of trusted people to provide such protection. Liuwa Plains, for example, is a source of meat and cultural pride for the Lozis due to the large numbers of wild animals, especially wildebeest. To ensure protection of this resource, the critical area where these populations range is surrounded by villages whose headmen help protect the resource from any source of destruction.

Some of the possible effects population size may be having on specific CBNRM areas in Zambia are summarize in Table 2 below:

Table 2. Population size effects

Conditions where populations size may exceed CBNRM limits	Threats
1) Upper Lupande	Increased consumptive rates of natural resources (timber, fish and wildlife), encroachment of wildlife habitat, urbanization
2) Lower Lupande	(same as Upper Lupande)
3) Mumbwa East	Encroachment of wildlife habitat, timber loss, excessive fires and honey-gathering
4) Kaputa	Loss of habitat from agricultural expansion
5) Bilili	Loss of habitat from agricultural expansion, conflicts around vital wildlife waterholes
Conditions where CBNRM areas are not settled or w/o residents	
1) Lunga Busanga	Vulnerable to poaching without well organized community role to protect resource
2) Lunga Lushwishi	Vulnerable to meat trafficking from Copperbelt and lacks presence of local residents to police area
3) Nkala	Nil, area small enough to have adequate contact with local land owners
4) Sichifulo	Residents living outside GMA not involved or protective of wildlife, poaching high

The Lupande areas represent a particular challenge for CBNRM and may actually be a lost opportunity for planning CBNRM in a highly populated area. This GMA is center to the growing commercial market of mass game-viewing tourism. Much of its underdesirable spin-offs in terms of secondary businesses and immigration of people for job opportunities have not been well planned. The unfortunate build-up of these industry related disturbances has promoted increased rates of resource use conflicts that have now

become difficult to control. Possibly related to these dynamics is the growing sense of economic and material expectations among local residents, possibly associated with tourist lodges, lodge owners and visiting clients. Compounded to these considerations is the fact that much of the tourism industry is in close proximity to village communities in the GMA.

To support the wildlife tourism industry, road access to Lupande is favorable, and this has facilitated a rapid growth of economic expansion and agricultural development. Cotton, for example, has become an important cash crop, far exceeding the possible rewards wildlife is able to bring to household producers, especially those not employed in lodges. The complexity of these issues, combined with a population of over 40,000, may well jeopardize CBNRM success in Lupande and may therefore justify greater external interventions by Government to ensure land use zoning is implemented and enforced. Continued reliance on CBNRM as the appropriate process for achieving these results may allow further erosion of the natural resource base for the area. Alternative approaches may need to be considered.

The critical lesson Lupande offers Zambia for its CBNRM efforts is for community leadership to plan and be firmly committed to their land uses at an early stage and to better anticipate the ecological consequences of both economic and human population growth in a CBRNM area.

To a certain extent, Mumbwa East has many of the characteristics of the Lupande area, though on a smaller and possibly more manageable scale. Improved road development, high human population and greater access to agricultural markets has fueled an increased pressure on farmland and thus increased encroachment on Mumbwa East. The consequence on the community's wildlife industry has been severe, which has contributed to cessation of safari hunting in the area and a substantial loss of ADMADE income for the community. Perhaps for this reason, resolve by the community to limit settlements in the hunting area has been shown by pledging to solve these issues in a co-management agreement with a new investor, who is making substantial investments to help reopen Mumbwa East as a safari hunting area.

Human population pressure on Bilili and Kaputa has likely had irreversible negative trends on wildlife production for these two GMAs. While limited safari hunting is still practiced in Bilili, and was once one of the best areas to hunt buffalo in Zambia, more than half of the area is farmland with severe competition for waterholes formerly used exclusively by wildlife. Legal hunting has now ceased in Kaputa GMA because of depleted wildlife stocks and loss of wildlife habitat from increased settlements.

If communities are proven to be effective allies in resource management through the CBNRM approach, then areas lacking residency by the community landowners may limit the positive role communities can play. Among the areas where this problem may be most relevant is Sichifulo and Lunga-Lushwishi. Both are exposed to nearby urban markets and in the case of Sichifulo, residents practice farming practices with livestock outside the GMA and may have developed stronger cultural ties to livestock and farming than wildlife as a land use. Both areas experience relatively high rates of poaching and neither have demonstrated a strong protective role by the community, except for their salaried village scouts.

Factors influencing household benefits from ADMADE

Decisions on how to utilize the community development funds (the 35% share) has been solely the responsibility of the Wildlife Management Sub-authority, with minimal influence by WCRF, NPWS or Nyamaluma, other than to monitor and intervene when flagrant violations of financial controls have occurred. In addition, numerous training seminars were provided by Nyamaluma to help improve the participatory process local leaders use in planning and implementing ADMADE projects. Table 3 summarizes projects supported by ADMADE or by collaborating ADMADE partners (e.g. safari operators, local NGOs) for the period from 1996 though 1998 (funds have not been released yet for 1999).

Unit name	VAG Name	Count of projects	$ Total
Chifunda	Kasela	12	18559
	Luelo	7	36464
	Mapamba	2	7141
	Zumwanda	2	6477
Chikwa	Chilumba	2	1136
	Chimpamba	1	1119
	Lilundi	1	1444
	Lumezi	10	43393
Lower Lumimba	Chasera	3	532
	Chasera and Mukasanga	1	15011
	Lukusuzi	2	3128
	Mukasanga	1	2040
	Mukwela	10	34395
	Yakobe	1	889
Munyamadzi	Chilima	1	17
	Kalimba	1	17
	Kazembe	1	17
	Nabwalya	1	17
	Pelembe	1	17
Upper Lumimba	Chocha	11	9530
	Kataba	9	2555
	Kazembe	1	8959
	Lumimba	4	2917
	Nthumbe	4	2654
	Zokwe	2	1288

While the total number of projects is generally impressive, the community process used for assessing household needs for project identification and supervising project implementation and expenditures has been controlled by the Sub-authority. Despite efforts to create Village Area Group structures to bring the process of decision-making down to a lower level, success has been mixed. Where these efforts have been relatively successful, response by the community to support objectives of wildlife conservation has also improved. Where efforts have been unsuccessful, the converse has been true.

Case Study: Chifunda

During 1995 and 1996, decision-making by the Sub-authority was centralized around the local Chief and all projects were being carried out near the Chief's Palace . Wildlife poaching was high and the unit leader concentrated on improving housing for his staff and reopening wildlife camps. During these two years local residents provided no information on poaching activities to assist with the area's law enforcement, nor did any member of the community surrender any firearms. During the 1997 and 1998, the new ADMADE structure was introduced that recognized Village Area Groups and Sub-authority Sub-committees for helping facilitate community discussions to identify projects and allow more people to participate in them. By the end of 1998, each VAG had its own ADMADE project and in that same year, the Chief and the Unit Leader received 21 muzzle-loading guns surrendered by local residents and between 20 and 25 village informants helped in bringing about 11 different arrests of people who violated the Wildlife Laws of Zambia.

Case Study: Munyamadzi

VAGs were created in 1998 with the election of committee members. A major problem recognized by nearly all VAGs was food shortages during the wet season and VAGs requested ADMADE funds purchase food relief. By the end of 1998, the Financial Management Committee and the Community Development Committee (CDC) had successfully purchased and transported 650 bags of maize from Lundazi to Kanele in Munyamadzi GMA. This feat involved considerable planning. Such a community-run enterprise had never been carried out before. Maize was distributed to each VAG and the CDC provided leadership to ensure families most vulnerable to famine and without the resources to buy maize were give maize for free. Other families were allowed to buy or have maize on credit at cost.

From Sept 1997 to Sept 1998, there were eight cases of local residents apprehended for wildlife law offenses and no cases of local informants assisting with arrests by village scouts. During the period from Oct 1998 to May 1999, there was only one case of a local resident apprehended and there was a total of 7 incidences where residents provided information about the presence of poachers in the area.

Case Study: Chanjuzi

In 1997 a financial scandal cost the community in excess of K10,000,000 from their community funds. The community book-keeper was charged with forging cheques and suspicions arose over possible involvement by members of the Sub-authority. Tragically, the unit leader took his own life, though his own involvement in the case was never clear. Throughout 1998, funds were withheld from the community until legal investigations were carried out and a new bookkeeper was trained and certified. As a result, the new ADMADE structure was not put into place and no new projects were supported for the entire year. Because of the scandal and apparent breakdown in leadership, introduction of VAG structures was also delayed. In short, Chanjuzi became a dysfunctional ADMADE unit until the end of 1998 when a new unit leader was assigned to the area and community meetings were convened to establish VAGs with assurances their 1998 earnings would be allocated to them once the new ADMADE system was introduced.

Prior to this and during most of 1998, Chanjuzi experienced a serious breakdown of community commitment to conservation. Residents resettled in Chipuka Plains, which had previously been zoned by community leaders as a no settlement area to help support safari revenues for the unit. Lion baits were vandalized by local residents and poaching occurrences increased to levels that forced the professional hunter to leave the area early in the season. Fortunately, the local chief played a pivotal role with members of his Resource Management Committee to evict the settlers from Chipuka Plains and early in 1999 the community adopted stringent controls on their land use plans to reduce disturbances that might jeopardize the industry.

Factors contributing to poor distribution of ADMADE benefits

ADMADE has operated under an administrative setup from its inception without strict legal mechanisms governing its procedures. This arrangement was largely based on trust that local leaders representing the community would uphold good governance for their ADMADE activities. Regular visits to the units by WCRF, Nyamaluma or Command Wardens may have encouraged such governance but due to insufficient funds, such visits were infrequent at best. This weakness in the programme may have created opportunities for financial abuse. For example, there have been no official audit inspections of community accounts for the past two years. While details are sketchy, financial mismanagement is evident in many ADMADE areas and appears more widespread in Kafue areas where unit visits have been significantly less than in Luangwa areas.

One source of abuse has been the local chiefs themselves, who serve as signatories to the community account and therefore have much control over the use of these funds. There are cases of almost total monopolistic authority of these funds and in some instances, this has led to serious stagnation of ADMADE progress. In Sichifulo, for example, the Royal family has regarded the ADMADE funds as their personal account and has used it for personal 'allowances' and not a single community project has been implemented in Chief Nyawa's area for the past two years. Similar abuse of controls meant to protect community's interests in ADMADE has been identified for West Petauke, Lower Luano, and certain Chiefs in Mumbwa area. As mentioned earlier, Chanjuzi lost a complete year of ADMADE funding in 1998 because of the mismanagement of ADMADE funds the previous year by the community bookkeeper for that area.

Most of the Chiefs in the Luangwa Valley have used community funds to construct new Chief's palaces, at an average cost of $9880. While such projects were approved by the Sub-authority, there is obvious concern over how much influence the local chiefs have had in adopting these projects. Other projects that might have reduced wildlife conflicts or improved living standards for households income production in the area were obviously delayed or cancelled because of competition for funds. For example, in Chikwa area the Chief has embarked on a new Palace for himself while Kanga VAG, which is the sole source of wildlife income for Chikwa area on the east bank, has never been supported with a single project. Land use disturbances are very high in this VAG where people have to compete with wild animals for water and prime hunting areas are frequently disturbed by local fishermen and honeygatherers. A similar situation exists in Mwanya where relatively little ADMADE benefit has been provided to Yakobe VAG and

yet most of the revenue earned in this unit is derived from Yakobe area. While such decisions may reflect poorly on the judgement of those people holding positions of leadership, they also suggest a lack of understanding about these relationships and the critical need to provide training on how to plan development priorities when such development is linked to resource revenues.

Another factor that has influenced the flow of ADMADE benefits to community members is the high cost of maintaining a community vehicle. A number of units (Mwanya, Chikwa, Chifunda and Munyamadzi) have bought community vehicles with their ADMADE revenues, and while impressive in terms of financing vehicle replacements in the unit, these vehicles have proven to be a serious drain of limited funds meant for community projects. With the possible exception of Munyamadzi, these vehicles are generally regarded as personal vehicles to the chief and there has been little attempt to maintain guidelines or controls over the use of these vehicles. As a result, in two cases (Chikwa and Mwanya), excessively high vehicle repair bills have been paid by the Sub-authority, thus draining the total funds meant for community development. In Mwanya, there is currently an outstanding bill of K11,000,000 and for Chikwa, K10,000,000, for community vehicle repairs.

In ADMADE's earlier years projects were supported mostly in close proximity to the Chief's palace. This pattern has begun to change over the past several years, with an increased proportion of projects supported in other VAG areas besides that of the chief (see Appendix I for maps and details on projects). This represents a positive trend that has been facilitated by training workshops, VAG elections and more recently, and adoption of a Community-based Constitution governing ADMADE procedures. As these new structures are put into place with clear legal requirements for a more transparent and accountable distribution of community revenues, this trend will almost certainly improve further.

Population growth projections

The ultimate challenge for CBNRM in Zambia is how to sustain continued natural resource production as local populations grow with improved living standards and better access to health care. As mentioned earlier, a number of areas are already dealing with human population pressures that seriously threaten CBNRM success in their areas. These areas usually correlate with favorable farming conditions (e.g. Bilili, Mumbwa) or poorly planned economic development (Lupande). In most other cases, human density is still low enough for CBNRM planners to be pro-active in dealing with the concerns of resource use conflicts caused by an increase in human numbers.

Based on a household to household population survey of 5 ADMADE units in Luangwa Valley, human populations are characterized by having a large, under 18 year-old age class (see Fig 20), representing about 55% of the total population (see Table 4). Population density for these areas vary from 2.5/km2 to 4.6/km2 (see Table 5). Despite these relatively low densities, nearly all of the valley populations are poised for rapid population growth on lands that are critically deficient of arable farmland. In February of this year, severe famine struck may parts of Mwanya unit where population density is greatest among the five areas studied. For most of February and into March, wild grass seeds was the basic food staple. Malnutrition as evidenced by swollen bellies of children

was noticed as common by a visiting ADMADE officer. In addition, wildlife snaring reached high levels during this period, which even local residents confessed to. This dilemma suggests that increased family size may not be advantageous for families living on poor soils or where farming is unpredictable.

Given that wildlife production does not require added labor to a community, communities living on poorer soils may find an incentive not to have large families by depending more on wildlife benefits through ADMADE. The critical question is whether ADMADE can channel benefits to households where food security is a major problem. From the previous section, such assurances are currently not possible, but clearly if CBNRM leadership is motivated to increase wealth from their wildlife resources, then targeting villages prone to famine with direct household benefits is an important step. Another important step is having locally available know-how and facilities for families to plan family sizes. As an indicator of community acceptance to the concept of family planning, ADMADE has introduced throughout these five ADMADE areas skills in family health and family planning, using social marketing techniques to distribute family planning education and drugs. Over the past twelve months, there has been a steady growth in acceptance to family planning, thus providing a hopeful foundation for long-term planning of human numbers.

Table 4.	Age classes:					
Unit name	0 - 8	09 - 17	18 - 26	27 - 35	36 - 44	45 +
Chifunda	2525	1466	1286	769	527	868
Chikwa	1360	776	821	510	323	173
Lower Lumimba	1287	743	555	499	234	417
Munyamadzi	2103	1579	1031	769	538	336
Sandwe	667	519	353	185	136	224
Upper Lumimba	2691	1775	1210	810	569	569
Total:	10633	6858	5256	3542	2327	2587
	34.1%	22.0%	16.8%	11.4%	7.5%	8.3%

Table 5			
Area name	**Total population**	**Area (km2)**	**Population density (/km2)**
Chanjuzi	9330	2555	3.7
Chifunda	7441	2104	3.5
Chikwa	6607	2426	2.7
Munyamadzi	7945	3177	2.5
Mwanya	7359	1587	4.6

Fig. 20 **Age Distribution of Valley VAGs Combined**

Fragmentation of human settlements in a GMA

Settlement patterns in a wildlife area can be an important variable influencing wildlife production in a CBNRM area and can also influence the success in delivering CBNRM benefits to the community stakeholders. The following are some general descriptive patterns of settlements in some of Zambia's GMAs as well as some conclusions that may serve future efforts in planning improved wildlife production in a CBNRM area.

Figure 21 below illustrates the current pattern of settlements in most of the ADMADE areas in Luangwa Valley. Data are based on satellite imagery and ground truthings for Chikwa, Chifunda, Chanjuzi, Mwanya and Munyamadzi areas. Linked to this figure is Table 5, which describes some of the features of these settlements. The Kafue GMAs are considerably different from those in the Valley, except for Mulobezi, whose settlements are also scattered and follow riparian soils. For the most part, settlements occur outside the GMA (Lunga-Busanga, Lunga-Lushwishi, Sichifulo, Nkala and much of Mumbwa and Kasonso) or have experienced large numbers of settlements with extensive land clearings (Bilili and parts of Mumbwa). Such large scale clearings have been associated with growing human populations and increased commerical farming practices supported by livestock and mechanized equipment.

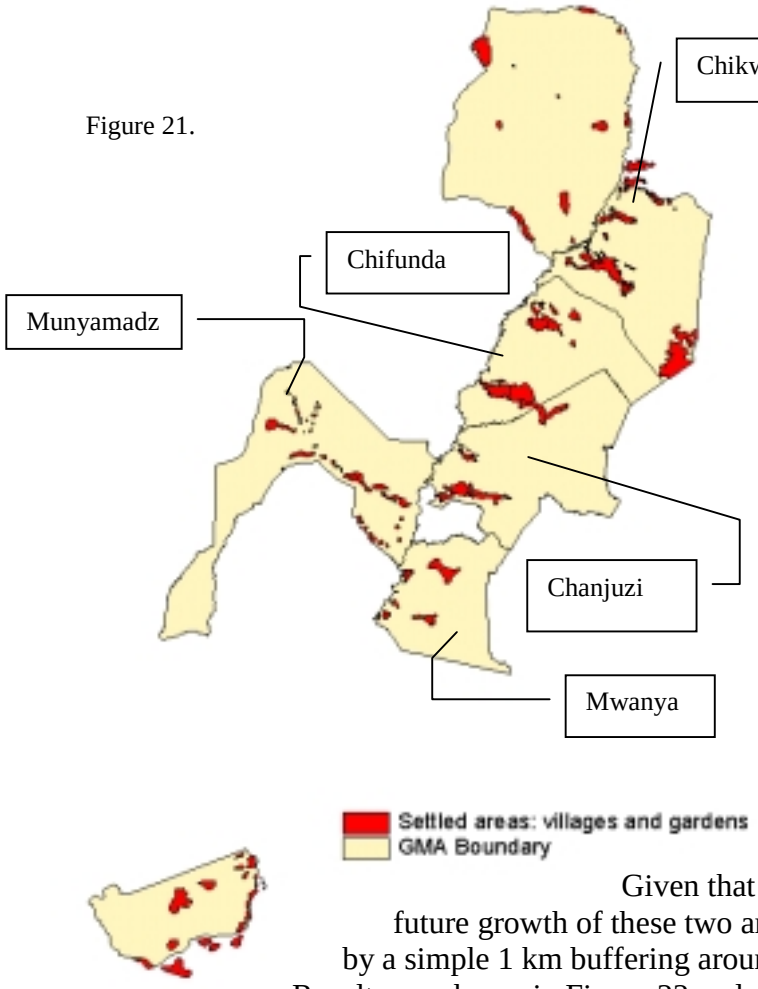
a) Effects on wildlife production

As shown in Figure 21, settlements are generally linear, following stream banks that offer alluvial soils. Except for Mwanya and Chikwa, most of the settlements are relatively distant from the Luangwa River. Total number of discrete settlements vary considerably, ranging from 52 in Chikwa to only 8 in Mwanya (see Table 5 below) and with comparable variation in mean settlement size, ranging from 10.3 km2 in Chanjuzi to 2.9 km2 in Mwanya.

Table 5 Name	Isolated settlements	Mean size(km2)	Total settled area (km2)	Settled area buffered 1 km	Total area (km2)	% of total settled
Chikwa	52	4.8	254		2426	10.5%
Chifunda	24	6.8	164		2104	7.8%

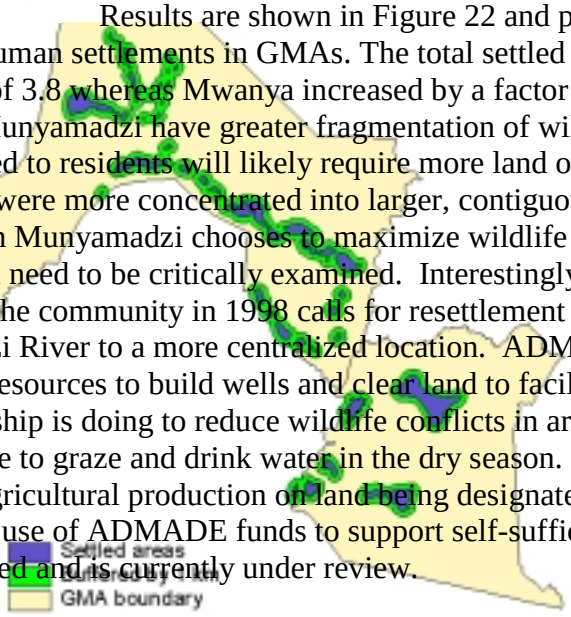
Chanjuzi	12	10.3	123		2555	4.8%
Munyamadzi	39	2.9	113	427	3177	3.6%
Mwanya	8	9.2	74	181	1587	4.7%

Figure 21.



While these patterns are most certainly influenced by soil constraints, there could also be appropriate CBNRM interventions that might alter these patterns in ways that would be more favorable to wildlife production as well as more favorable in providing ADMADE benefits to community stakeholders. For instance, a spatial analysis of settlement patterns in Munyamadzi and Mwanya show two extremes of settlement configurations: Munyamadzi has many small size settlements scattered throughout the area while Mwanya has fewer, less scattered bigger settlements.

Given that settlements are likely to expand, future growth of these two area's settlements can be modeled by a simple 1 km buffering around their existing boundaries. Results are shown in Figure 22 and provide a useful lesson for managing human settlements in GMAs. The total settled area in Munyamadzi increased by a factor of 3.8 whereas Mwanya increased by a factor of only 2.4 (see Table 6). Not only does Munyamadzi have greater fragmentation of wildlife habitats, but their total area allocated to residents will likely require more land over the long term than if settlements were more concentrated into larger, contiguous settlements. If local CBNRM leadership in Munyamadzi chooses to maximize wildlife revenues, then settlement patterns will need to be critically examined. Interestingly, a preliminary land use plan adopted by the community in 1998 calls for resettlement of households away from the Munyamadzi River to a more centralized location. ADMADE and Irish AID are combining resources to build wells and clear land to facilitate this resettlement, which the local leadership is doing to reduce wildlife conflicts in areas where buffalo and other species come to graze and drink water in the dry season. To promote and maintain improved agricultural production on land being designated for larger, more stable settlements, use of ADMADE funds to support self-sufficiency in food production has been proposed and is currently under review.



b) Effects on ADMADE implementation

Distances between settlements vary considerably among the different areas shown in Figure 22. Such variation represents a potentially important variable for coordinating and disseminating ADMADE information in a community and therefore the level of involvement and participation by local residents. Local understanding and support of ADMADE would be expected to correlate with the compactness of the communities in a CBNRM area. A recent survey of snare collections supports this assertion. Significantly more snares were found around the outer-lying, remote villages in Munyamadzi than among the larger villages in Mwanya, even though Mwanya has had a prior history of snare. It has also been able to more effectively disseminate ADMADE awareness to its residents.

Village fragmentation is often caused by families seeking out certain natural resources that improve or satisfy household needs, e.g. access to a waterhole, game meat, honey, better soils and so forth. Traditionally, Chief's headmen supervise movements of people to new sites on communal lands, but there have been numerous occasions where the chief was found not to be aware of new settlements until significant land use problems had already occurred. Given the importance of land use issues to the sustainability of wildlife production and the objectives of CBNRM programs, traditional systems for monitoring settlements may need further technical assistance from ADMADE. This could possibly allow local leadership to more effectively monitor these problems and plan more wisely the future growth of their community. Simple GIS technology applications have been applied in various ways to support this process and such applications for improving CBNRM efforts to monitor and inventory land settlement patterns are now being taught by Nyamaluma Institute.

What should be stressed is that the Chief's have been exceptionally effective in resolving settlement conflicts where such conflicts threaten or seriously disturb the safari industry. Perhaps more than any other reason, the continued role of Chiefs in resolving land issues is an important variable in ADMADE's future success. Such decisions are made through traditional channels and these decisions are usually respected and accepted without serious retribution to the resource or to the stability of the community.

Measures that prevent such conflicts from arising are critical for CBNRM success, and while they include legitimate leadership roles of the chief, there are important and effective ways that well designed development projects can also reduce the effects of land fragmentation by new settlements. A number of variables are currently being proposed and planned at the community level through a series a land use planning workshops being facilitated by ADMADE/Nyamaluma. These variables include 1) water security and reduced conflict at waterholes: the financing of wells, 2) food security: electric fencing, fertilizer credits, early planning of food relief with ADMADE funds, improved agricultural practices, and improved road access and 3) alternative sources of income to reduce pressures on game meat as a commodity for bartering.

<u>Number of traditional leaders associated with a GMA: lessons for CRB formation</u>

In past years ADMADE leadership at the community level has been largely directed by the local chief of the area and has usually followed many of the traditional channels of administration local chiefs are accustomed to, including indunas and village headmen. The ADMADE experience has shown many examples of the positive value of how such traditional leadership impacts on a community for unifying and stabilizing community perceptions and commitment to locally determined policies. The liabilities of having sole dependence on chiefs for ADMADE leadership, however, in terms of financial management and ADMADE benefit sharing have been a primary factor in promoting increased democratization of ADMADE. As ADMADE continues to evolve its structures and systems of local governance through a coordinated leadership of Community Resource Boards and local chiefs, an important variable that may influence the success of this process is the number of local chiefs in a given CBNRM area. As the number of chiefs increase, the likelihood of certain problems affecting ADMADE's success for the entire community may also increase:

a) difficulty in achieving consensus among the separate chiefs and their subjects
b) increased support requirements for the chiefs at the expense of general community needs
c) difficulty in enforcing land use decisions affecting the entire CBNRM area
d) difficulty in balancing ADMADE benefits with development needs and management priorities.

These concerns are reflected with actual data on resource disturbance trends, shown in Figures 23 and 24 below.

Fig 23

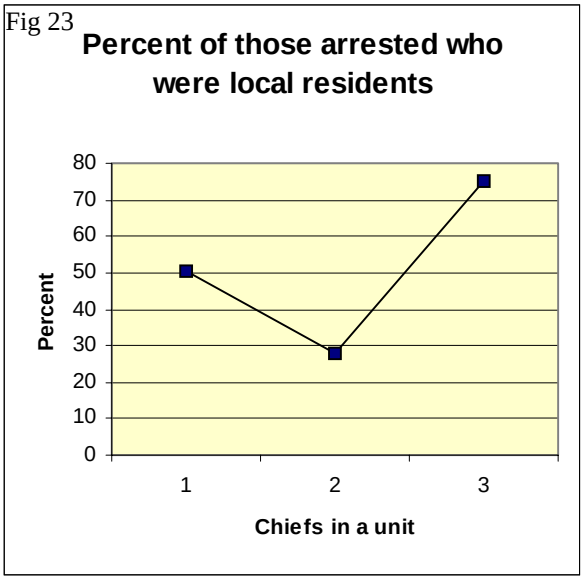
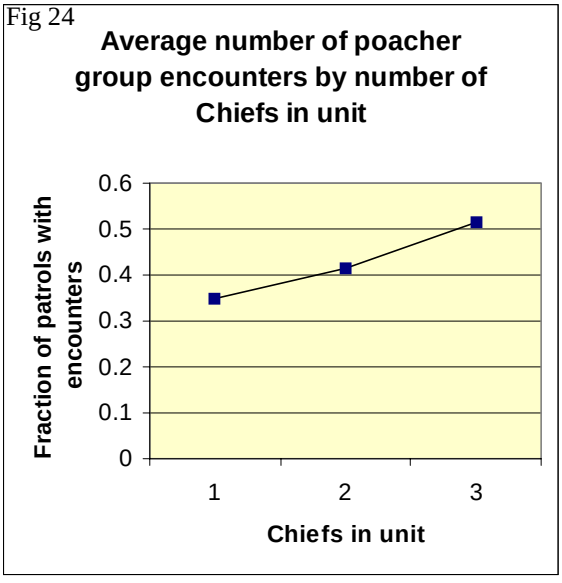


Fig 24



Ideally, therefore, it may be advisable for ADMADE/CBNRM units to be at the Chief level. In most cases this is possible if the chiefs' areas involved are large enough to sustain a viable wildlife industry on their own. Such a situation arose between Chikwa and Chifunda. These areas were formerly combined as a single ADMADE unit in Musalangu East GMA. Conflict between the chiefs over revenue sharing and accusations over cross-border disturbances eventually resulted in the split of the two areas as separate hunting blocks. Each area is now accountable for their own hunting area and the revenues derived from them. CBNRM results in terms of consolidation of community efforts to support ADMADE have subsequently improved.

Such conflicts continue to occur in other areas, most notably West Petauke, where the two local chiefs have accused each other of violations of past agreements to control poaching. Dialogue between the chiefs has broken down over the past year and there is little evidence to suggest these two communities will be able to effectively work as a single CRB. Part of the problem may be the large distance that separates the chiefs and the infrequent occasions for them to discuss issues together.

Other areas where such conflicts have arisen in the past but with less severity are Chitungulu and Kazembe (Chanjuzi Unit), Moomba and Nyawa (Sichifulo), and local chiefs in Rufunsa. Overcoming these conflicts will be an important basis for ADMADE success in cases where individual Chiefs' areas cannot sustain a single safari operator. In these cases it may be necessary to develop a higher CBNRM authority to deal with land management issues while providing greater autonomy to individual chiefs' areas for leadership in meeting development needs.

Level of skills available within the community for administering and implementing CBNRM.

Developing the necessary skills for communities to implement ADMADE is likely to be influenced by at least three different variables:

1) level of skills and education in communities,
2) level of ADMADE training provided, and
3) caliber of skilled ADMADE practitioners working with communities.

1) Level of skills and education in communities

The first variable is important in that it establishes a baseline of skills within the community for achieving resource management and community development objectives of ADMADE. The recent CRB elections recently concluded in four of the Luangwa Valley units clearly shows that people administering ADMADE in the recent past were not the most qualified or best educated people available in the community. Though Wildlife Management Sub-authority members were said to have been elected, not all of the community actually participated in these elections and as a result members were not necessarily representative of the whole community. There were many instances of people favored by the chief having a seat on the sub-authority and while loyalty to the

chief is important for social stability, other people with possibly more educational and professional background were excluded from the ADMADE process. Tables 7 and 8 below, together with Figure 25, show a sharp contrast between the caliber of CRB members recently elected in a democratically monitored election and those elected through the previous ADMADE leadership structure of Wildlife Management Sub-authorities.

Table 7. Education of sub-authority members

	Below 7	7	9	10	12
Chanjuzi	2	5	5	0	1
Kazembe	0	8	2	1	0
Mwanya	5	4	1	0	0
Chifunda	1	6	0	0	1
Chikwa	0	8	3	0	0
Total	8	31	11	1	2
Per cent	15%	58%	21%	2%	4%

Fig. 26

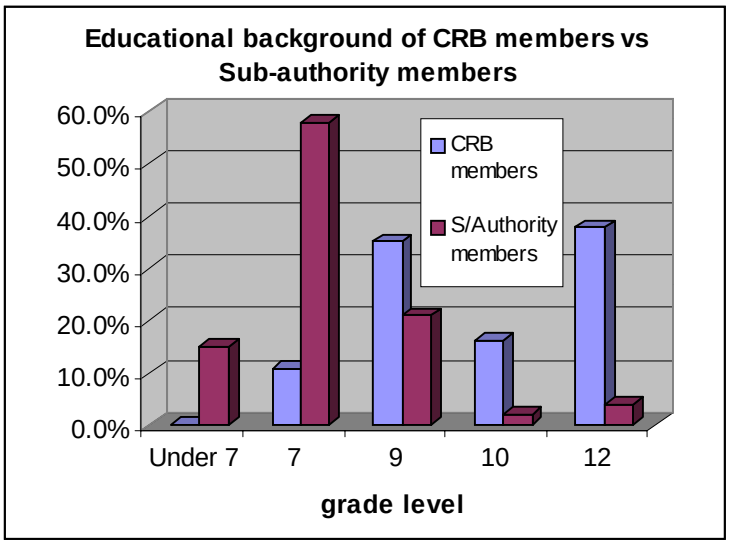


Table 8. Education of CRB members

Unit name	7	9	10	12
Chifunda		3	1	4
Chikwa		4	1	5
Upper Lumimba combined	4	6	4	5
Total	4	13	6	14
Per cent	10.8%	35.1%	16.2%	37.8%

One important factor that helped bring about these results was an extensive pre-election awareness campaign. This helped to ensure that all members of the community were aware of these elections, procedures for nominating candidates, and when and how elections would take place. In addition, public meetings were convened to explain the new ADMADE structure and why these elections were needed to support this new structure. To improve the caliber of CRB members, minimum educational standards for candidates were set at grade 9 and grade 12 was required to be eligible for chair of the CRB. In contrast, educational standards were not preconditions for membership on Wildlife Management Sub-authorities. Another procedure used that enhanced election results was the manning of polling stations by Government workers to ensure residents were able to vote freely and privately.

Women's role in ADMADE has been relatively low and has caused concern with the need to involve more full participation by the community. The CRB election revealed some interesting results that may possibly explain the uneven distribution of participation by gender. Table 9 shows the total number of candidates who were nominated members from their respective VAGs. Of the 81 nominated and who contested, only 3 were women and of these only 1 was elected. In contrast, 43.7% of the total number who participated in the nominating process were women, suggesting that women did not vote for their own gender for reasons not yet clear but most probably is related to the low occurrence of educated women who could meet the educational

Table 9. Unit	CRB candidates	Nominating supporters Men	Women
Chikwa	24	298	182
Chifunda	19	214	166
Kazembe	19	186	194
Chitungulu	19	214	166
Total:	81	912	708
Per cent:		56.3%	43.7%

requirements. The single woman who was elected worked as a professional secretary in ZCCM and has retired in her home village. If this hypothesis is correct, it shows the great need for women to be more actively involved at the VAG level where educational requirements are less stringent and to be more committed to improving educational opportunities for women in the village

Because of these more elevated standards of the CRB, it is hoped and expected that these democratically elected leaders will be far more capable of applying ADMADE methods and skills to support the resource management, financial management and community development needs of their area. Previously, a small but significant percentage of community participants who attended skills courses at Nyamaluma Institute were not sufficiently educated to fully benefit from the various courses taught. This lowered the likelihood of participants effectively applying what they learned to improve ADMADE results in their own areas.

2) Skills training provided to communities

a) Local leaders

Despite the past problem of sub-authority members having a relatively low educational background, a total of 30 different courses were offered to both Sub-authority members and members of the various technical sub-committees, involving 393 participants from 1997 to 1998. Nyamaluma piloted its first community leadership 'skills courses' during this period in the Luangwa Valley where progress could be more closely monitored and costs reduced. This large discrepancy of community participants from Luangwa and Kafue GMAs who received ADMADE training from 1997 to 1998 (shown below in Table 10 with 'x' indicating unit was represented with participants) provides a useful basis for correlating indicators of ADMADE success with levels of community training.

Table 10

Luangwa Units	**CDC[1]**	**FMC[2]**	**RMC[3]**	**Book Keeper**	**Chiefs leadership**	**Quota setting**	**Drama skills**	**Land use planning**	**Bee Keeping**	**Family planning**
Chikwa	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Mwanya	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Chifunda	**X**	**X**	**X**	**X**	**X**	**X**	**X**			**X**
Chanjuzi	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Munyamadzi	**X**	**X**	**X**	**X**	**X**	**X**				**X**
Kafue Units	**CDC[1]**	**FMC[2]**	**RMC[3]**	**Book Keeper**	**Chiefs leadership**	**Quota setting**	**Drama skills**	**Land use planning**	**Bee Keeping**	**Family planning**
Mumbwa		**X**	**X**	**X**		**X**	**X**		**X**	
Sichifulo	**X**	**X**		1999						
Mulobezi			**X**	1999	**X**					
Lunga										
Kasonso	**X**			**X**						

[1]*CDC* *Community Development Committee*

[2]*FMC* *Financial Management Committee*

[3]RMC Resource Management Committee

Table 11

Luangwa Units	Projects	Total $ costs
Chifunda	23	68641
Chikwa	14	47092
Mwanya	18	55995
Chanjuzi	31	27903
Munyamadzi		
Kafue Units		
Mumbwa	11	(not well documented)
Sichifulo	8	(not well documented)
Mulobezi	2	28000
Kasonso	2	(not well documented)
Lunga	3	(not well documented)

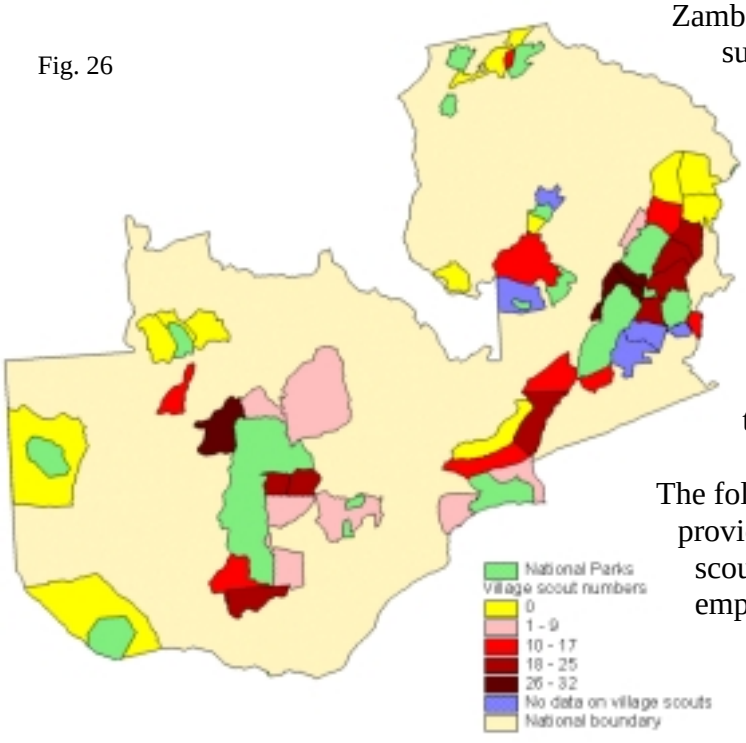
The contrast in community development between these two regions (see Table 11) presents a strong testimony to the critical importance of training local leaders and ADMADE participants in CBNRM skills. In this table projects completed or still in progress since 1994 are listed.

Developing ADMADE's training curriculum has been an adaptive process that offers skills that specifically support the ADMADE structure and the CBNRM needs communities most commonly have. As the structure itself changes, which normally happens in response to needs assessments and critical reviews of ADMADE performance, then adjustments in curriculum and training focus are made accordingly. Such an approach allows continual consolidation of 'lessons learned' into an advancing and more comprehensive curriculum. This procedure minimizes risks of confusing CBNRM participants with cross-conflicting skills and priorities for what is expected of them. A more complete review of the training program being offered to CBNRM communities is provided in the supplemental paper, 'Reaching Out to Rural Communities', which reviews in more detail how CBNRM monitoring, training, and results analysis are integrated to support CBNRM skills development in ADMADE.

2) Village scouts

Not all GMAs yet have village scouts, and in most cases this is because these areas have insufficient wildlife numbers to support a viable safari industry. In general these areas are referred to as under-stocked GMAs and account for over a third of the GMAs in Zambia. Village scout salaries are supported entirely from ADMADE revenues, and without village scouts, GMA management and protection is almost exclusively dependent on the relatively few civil servant scouts who are stationed in the area. Figure 26 shows which GMAs in Zambia are currently being supported with village scouts and their total numbers.

Fig. 26



The following sets of information provide a useful profile of how village scouts, as a locally recruited and employed workforce, are contributing

to the wildlife management effort in Zambia's game management areas.

a) Educational background

A key feature to ADMADE's approach to wildlife management has been the reliance on local residents to manage, protect and monitor wildlife resources on their own lands. Village scouts, who are local residents, perform much of this work. Formal education is not mandatory to be eligible as a village scout, though minimal grades are required for village scouts to be allowed to perform certain duties, such as data collecting and monitoring of hunts. The primary objective of village scouts is to balance the need for local employment to discourage from poaching with the need to attract better educated people to learn advanced wildlife management skills.

Figure 27 below shows a frequency distribution of village scouts trained at Nyamaluma and their educational background. From personal interviews conducted with selected samples, it is estimated that not less than 30% of village scout recruits come with backgrounds in poaching or illegal hunting prior to their training. This points argues that a high proportion of village scouts have considerable knowledge of 'bush lore' and the habits of poachers in their area. The objective of their training at Nyamaluma is to put this knowledge to practical use for wildlife management.

Fig. 27 **Educational Profile of Village Scouts**

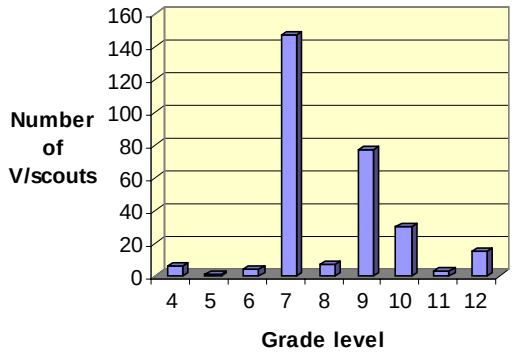
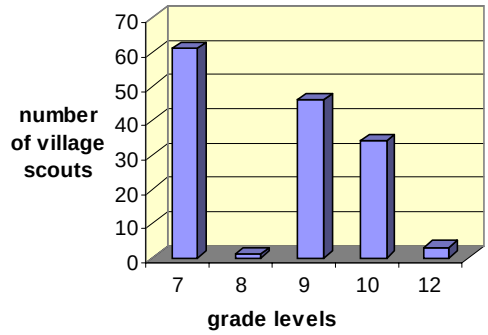


Fig. 28 **Educational levels among village scouts given advanced training**



Of this sample, continued advanced training is offered to those village scouts with a required education level and who show aptitude for the particular skills course being offered. Figure 28 above summarizes nine past advanced courses and the frequency of village scout participants by grade level.

b) Contribution to management manpower

With the introduction of ADMADE, the overall scout workforce has increased by a factor of approximately 2.7, as shown in Table 12 below. This increase is based on the units listed for which data are most accurate and where ADMADE has been most active. The comparison is based on those scouts paid by Government (NPWS trained scouts and Civil Daily Employee untrained scouts) present in 1988 and the total scout workforce present in 1999. The latter figure equals the scout number supported with GRZ salaries and those supported by ADMADE generated revenues (village scouts, senior village scouts and assistance village scouts).

Table 12 ADMADE Unit	Most Recent	Pre-ADMADE
Chifunda	36	6
Chikwa	33	9
Kasonso	46	5
Lower Lumimba	47	18
Lunga combined	43	7
Mulobezi	20	4
Mumbwa	54	26
Munyamadzi	46	24
Sichifulo	37	16
Upper Lumimba	42	35
Total:	404	150

As was discussed in the USAID 2nd Quarterly Report, salary support for village scouts is about .3 to .5 the cost of a GRZ paid scout, though both contribute approximately the same level of patrolling effort per scout. Based on the fact that GRZ scouts must leave the unit to receive their salary cheque in town, the total amount of time a GRZ actually stays in the unit is presumably less than that of a village scout, who is paid locally by the community bookkeeper. This would allow village scouts greater time to participate in other duties expected of a village scout, such as crop damage control, community education and monitoring of hunts.

Table 13 1991 to 1999								
Staff Category	N	died	dismissed	resigned	retired	transferred	Total	Per cent
ADMADE	75	4	4	2			10	13%
GRZ	88	3	13	1	8	5	30	34%
1995 to 1999								
Staff Category	N	died	dismissed	resigned	retired	transferred	Total	Per cent
ADMADE	257	14	5	11	2		32	12%
GRZ	281	13	15	1	14	26	69	25%

Another important difference explained in Table 13 above is the higher loss rate of GRZ scouts as opposed to local village scouts. This difference might result in lowered work commitment for GRZ given that they have a greater chance of being transferred to another area. The higher replacement rate of GRZ scouts would also suggest they have less long-term knowledge of the area where they are serving as opposed to village scouts.

c) Impact on patrol effort and area being policed

The increase in total manpower has contributed to an increase in camp size and in some units an increase in number of camps. Prior to ADMADE there were no permanent records of patrol effort or results collected by scouts. An accurate comparison with current scout patrols in ADMADE areas is therefore not possible. However, if one assumes that scouts were patrolling with the same level of effort prior to ADMADE, then increase in camp size by employing local residents as village scouts would have had a noticeable impact on patrolling output. This is demonstrated in Figures 29 and 30 below.

Fig. 29

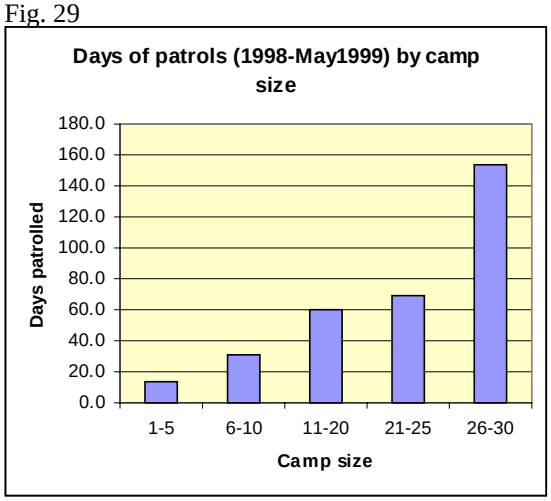
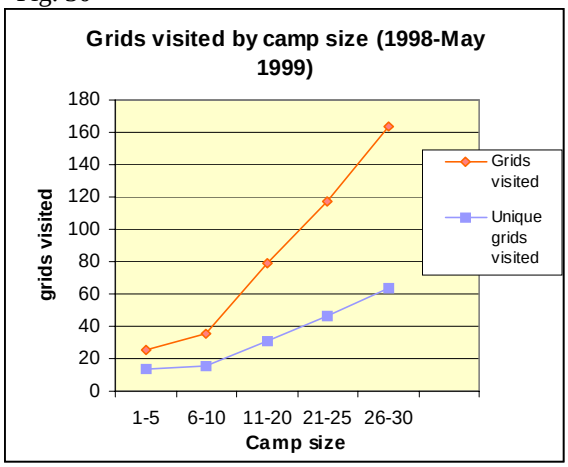


Fig. 30



In both figures indicators of patrol effort (average total days patrolled by size of the camp the patrol originated from, and number of total grids and unique grids scouts visited on patrol by camp size) show increased patrolling effort as a function of camp size.

d) Data collection and applications of data to wildlife management

With the continued advanced training provided to village scouts by Nyamalauma Institute, village scouts have progressively improved their skills in CBNRM responsibilities, most notably civic education, resource monitoring, data collection, law enforcement, and public education skills. This training has been designed to broaden the role of the community in managing their natural resources and a review of how these skills are now being applied in ADMADE areas is presented in Table 14 below.

Table 14 Outlining Important Management Skills Taught to Village Scouts and their Applications

Training category	Results of training	Impact of training
Monitoring	1) Collection of hunting data	1) Increase revenue (e.g., payment for wounded animals, validation of licenses, etc.) 2) Data used for quota setting 3) Data on licensing abuse, assisting with design of new licensing system 4) Client data used for land use planning
	2) Recording of disturbances (patrols and hunt monitoring)	1) Locations of fishing camps, poacher routes, new settlements, important waterholes, etc. recorded; information used for zoning and land use decisions 2) Impact of certain land uses leads to formation of better managed land use activities, eg. bee-keeping groups, which also lessens bushfires

Civic education	1) Improved local understanding of snaring and poaching effects on ADMADE income 2) Improved awareness on potential problems of new settlements 3) Improved awareness on value of wildlife and benefits thru ADMADE	1) Reduce local involvement in poaching and snaring 2) Increased acceptance to relocate villages 3) Reduced cultural barriers to implementing ADMADE
Law enforcement	1) Improved local understanding of Wildlife Laws 2) Improved sense of resource ownership promoted thru law enforcement by local residents 3) Collection of data on law enforcement effort and results	1) Reduction in poaching 2) Increased cooperation among local residents to provide information leading to arrests 3) Improved accountability of who is patrolling, useful to local leadership for supporting bonuses or contract extensions to village scouts 4) Improved information for assessing management effort for developing better management plans

e) Economic impact of trained village scouts

With the availability of better trained and qualified scouts to monitor both legal and illegal forms of wildlife use, there are now improved checks on possible sources of income loss caused by unethical hunting practices (e.g. not endorsing wounded animals on license) or possible errors in the issuing of licenses. In Table 15 below, data collected by village scouts on all safari clients who hunted in Zambia in 1998 shows the number of occurrences for individual areas where more than one animal was hunted on a single license. These data were used to identify possible cases of unlawful hunting or improper licensing procedures. Potential income losses are also reflected in this data. With such information now available, investigations can be more easily conducted. This has helped to provoke a much needed debate on improving the safari licensing system.

Table 15.

Number over-used lisenses	Number potentially unlicensed animals	Lost Value($)
3	3	$2,200
8	9	$6,800
1	1	$600
10	13	$8,200
9	9	$6,100
6	6	$4,650
37	41	$28,550

A second source of possible revenue loss that village scouts are able to safeguard against is the under-recording of animals wounded by clients. In 1998 there were only three instances officially reported; but based on interviews with the village scouts who monitored clients, the number was estimated to be 22. Assuming most were buffalo, an average license fee not paid for these animals was estimated to be $700, or $15,000 of lost revenues for the season. Part of the problem of under-reporting by the village scouts may have been due to lack of vigilance by the unit leader supervising village scouts, training itself, or unscrupulous professional hunters. This problem was identified by

matching field data with village scout interviews and again shows the value of having local residents contnually trained to improve wildlife monitoring in their area.

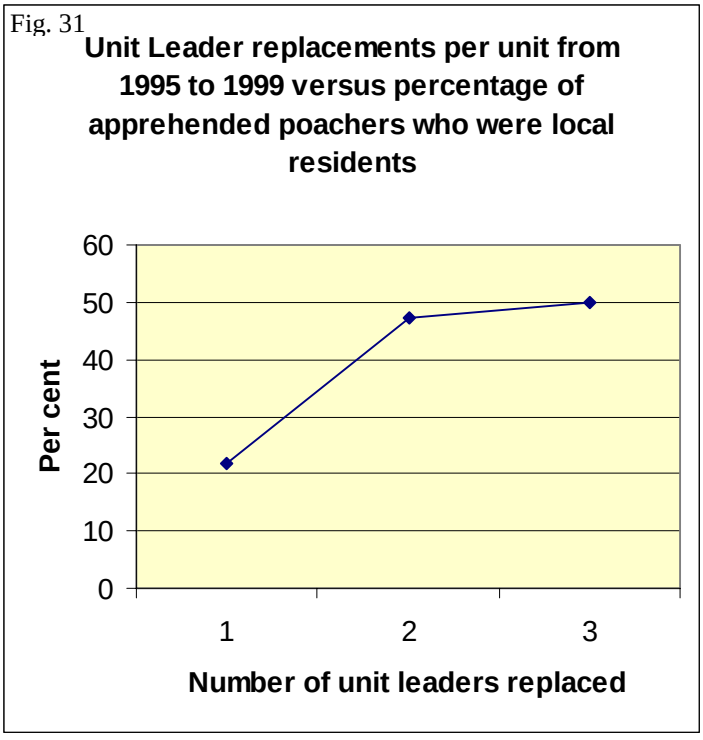
f) Impact on public attitudes and ADMADE awareness

While it is difficult to establish a direct cause and effect between the work of village scouts and subsequent changes in CBNRM attitudes among local residents, there are a few interesting trends that appear to correlate with increased efforts by village scouts to improve civic education in the community. In three areas where village scouts have organized drama groups to perform entertaining lessons on ADMADE, two have given rise to the formation of 'reformed poachers clubs', where residents who were once poachers have pledged not to poach and instead are encouraging their friend to stop as well. This has occurred in the Mumbwa and Chikwa areas. In a number of areas where Village Scouts serve as role models for their peers, there has been a significant increase among youths with backgrounds in poaching (eg snaring) working as Assistant Village Scouts. Such arrangements have been worked out in various ways to support the costs and have provided a useful base for recruiting future village scouts in these areas.

3) Caliber of skilled CBNRM practitioners working with communities

One of ADMADE's most critical and useful CBNRM practitioners is the Unit Leader, who is an NPWS field officer chosen for leadership, educational level, and proven work ethic. A four to six month training in CBNRM skills is provided by Nyamaluma and in most cases the candidate graduates as a Deputy Unit Leader. As a Deputy, the person is assigned to a unit where he or she works under a qualified Unit Leader until there is sufficient evidence to warrant the person to take up a unit on his/her own. Advanced trainings are offered annually to upgrade skills in CBNRM techniques and to review ADMADE performance in their respective area. Duties are varied and require skills in organization and planning to maintain work schedules for building CBNRM capacity in the community. These duties include village scout supervision, reporting on management issues to the Resource Management Committee and the CRB, management planning and budgeting with the community, monitoring wildlife uses in the area, facilitating quota setting meeting, and promoting a co-management relationship between the community and the private sector.

Fig. 31



Unit leaders are relatively well monitored by Warden and Nyamaluma Institute and are usually removed from the unit if their performance is poor. Therefore, if unit leaders are playing an important role in achieving ADMADE success, then those units where unit leaders were not replaced should be associated with units where ADMADE is working well. The indicator used for this analysis is

the percentage of people apprehended by scouts who are local residents. Communities having a successful ADMADE, if influenced by the leadership of unit leaders, should have the lowest percentage. Results presented in Figure 31 are consistent with this argument.

There is also considerable anecdotal evidence to further support the important role Unit Leaders play in influencing ADMADE's success.

Case Study: Mulobezi

The unit leader for this unit performed very well as a student at Nyamaluma and was deployed as a full unit leader to Mulobezi. Unfortunately, he was not well monitored and unknown to the Warden, senior NPWS officials and Nyamaluma was the fact that he and his village scouts were trafficking in game meat for at least a year. Mulobezi's performance during his tenure was extremely poor, with few tangible benefits realized by the community and below average results in patrolling effort by the scouts. Perhaps due to lowered expectations of ADMADE by the community, the chief has allowed new villages to encroach on potentially valuable wildlife areas.

Case Study: Chanjuzi

In late 1997 Chanjuzi suffered a financial scandal which subsequently led to the suicide of the resident unit leader. Ironically, the unit had a past reputation of being among the best managed CBNRM areas in ADMADE. The loss of the unit leader was in early January 1998 and he was not replaced until the end of the same year. During the interim the unit suffered a serious vacuum of administrative leadership for facilitating meetings and supervising the village scouts. Data were not collected, field patrols were infrequent, community liaison was poor, and a number of serious land use disturbances began to threaten the safari industry in the area. When a capable unit leader was eventually transferred to the unit, a dramatic change in village scout performance was noted, with three-fold increase in patrolling from the previous three months. The local chief was assisted by the unit leader to promote public awareness for the need to reduce land use disturbances. In addition, a very challenging task of removing 64 households from a wildlife sensitive area was successfully carried out.

A key lesson to the development of the unit leader's position is that their role needs to be fully recognized and supported by their supervising officers. From recent interviews, some unit leaders feel their wardens do not fully understand or appreciate the complex nature of their work in assisting communities to adopt CBNRM practices. As a result, they are not always given the support they need. A key requirement to a unit leader's success is that he be given the level of autonomy to exercise his skills as a CBNRM practitioner. Otherwise, community leaders will likely judge him as a government worker concerned more about pleasing his immediate supervising officer. The Luangwa Command, for instance, has demonstrated a very favorable working relationship between the Warden and the Unit Leader. Unit Leaders are given full freedom to pursue community-oriented workplans in support of ADMADE objectives with little interference from the Warden. Periodic meetings are convened where unit leaders brief the warden on their results, and unless results are poor, encouragement and continued support is provided by the warden.

3. Private sector variable: client service, community partnership

Under ideal circumstances, the private sector and the community have much to gain by working cooperatively together as partners in the wildlife industry. Such advantages include skilled local labor force, cost-effective wildlife policing, reduction in land use disturbances, and ultimately increased profits for both stakeholders. In recent years ADMADE has facilitated dialogue between these two parties and there is now growing evidence that some operators are adopting more CBNRM-oriented practices in the running of their businesses with increases in gross profits (see 2nd USAID Quarterly Report). Differences among the operators in terms of relative commitment to these practices, however, are still quite varied. In 1998 these differences were scored using various criteria. To recognize companies with high scores for demonstrating community partnership, the Ministry of Tourism presented to the winning companies the 'Conservation Bullet Award' at a formal public ceremony.

If there is a strong relationship between private sector commitment to CBNRM and sustained profits in the wildlife industry on communal lands, then it becomes increasingly important for Government to continue strengthening this link. One clear example of how this is being done is illustrated by the way Kasonso GMA was retendered in 1999. After it was shown that the current lease holding company defaulted on its lease agreement, the area became open to tender applications from different operators. The review committee set up by Government to judge these applications selected the company that was awarded the Conservation Bullet Award with distinction the previous year. By making such a choice, the industry was essentially told that CBNRM standards for running a wildlife industry in a communal area will be an important consideration for future tender selections.

While compliance to CBNRM standards may help promote long-term growth and sustainability in the industry, the more immediate concern of providing quality commercial services to clients generally takes priority throughout much of the hunting season. This is certainly understandable from the operator's point of view. If the operator is to successfully market its services in the future, then the operator must honor its pledges to clients, who often pay as much as $1300 to $1500 per day for these services. It is therefore unreasonable to expect a company to make CBNRM its primary concern, and indeed, there is much reluctance on the part of many operators to get formally involved with ADMADE by attending local meetings and reviewing issues and problems with the community. The reality, however, is that the industry conducts its business on communal lands and the importance of being constructively engaged with the community is of key importance to the long term future of not just the industry but the resource as well.

A major complaint that has been raised by a number of operators is that communities expect far too much from the operators for solving their development needs (building wells, repairing roads, buying relief food, etc) as opposed to using their own ADMADE funding with greater reliance on their own leadership. Over-dependence on safari operators will almost certainly result in frustrations and disappointments of local communities, who will likely respond with continued land use disturbances, such as snares, bush fires, and so forth.

Variables and general concepts

The solution to this problem requires a careful analysis of how the private sector together with the community can build a more competitive industry by working together to sustain conservation, community development needs, and higher profits. This section examines several variables that are likely to be important factors in this analysis.

1) Investment in the hunting area by the safari operator

Efforts by the operator to increase wealth for the community would be a visible demonstration of the positive role the private sector can play to improve the value of their wildlife resources through legal markets. One of the more obvious indicators of such investments is the development of hunting roads to allow clients to access more animals that could sustain larger profits. Other forms of investment include boreholes for wildlife camps, boreholes for wildlife in areas where water is a limiting resource, and wildlife restocking where species need reintroduction.

2) Extent of safari hunting area utilized by operator

Percentage of total hunting area accessed by hunting roads is another measure of an operator's commitment to develop the safari industry in the area

3) ADMADE investment in wildlife management

NPWS (ZAWA) has given the community through its ADMADE policy the responsibility to manage wildlife resources on their land and to control disturbances that may threaten the resource or lower industry profits. The ability to fulfill this obligation will most certainly depend on the financial support the community receives for basic wildlife management costs.

As argued in earlier sections, there is a large economic advantage for local residents to participate fully in wildlife management to ensure communal areas remain viable for commercial uses. Variables influencing the success of this process include the timeliness and amount of remittances paid by WCRF to support these efforts, the planning and use of these funds by local managers, and the accountability of these funds for achieving verifiable results.

4) Compliance to lease agreements

Compliance to lease agreements is a good indicator of a particular operator's commitment to observe rules and regulations laid down by Government to promote desirable standards in the industry. Lease agreements therefore provide a useful framework of private sector commitments to various principles of good hunting and business practices laid down by Government. Current lease agreements also contain a number of cardinal requirements for promoting partnership between the private sector and the community.

5) Equitable financial return to the wildlife producer (community) vs service provider (operator)

Unless the community as a whole sees an economic return from its efforts to manage and protect wildlife on their lands and believes this return is fair, competing reasons to snare and poach may prevail. In such cases community cooperation to support the industry in providing quality wildlife products will be compromised. Various factors that can be measured play a critical role in this perception by the community:

a) Absolute amount of money returned to the community
b) Procedure for sharing wildlife profits within the community
c) Use of money to meet community needs

Results

1) Investment in the hunting area by the safari operator

Direct investments in Zambia's hunting areas are being made by the private sector but vary considerably among the individual operators. Over the past three years of the current lease agreement, four companies have had their lease agreement revoked for reasons related to insufficient financial and technical capacity to run a viable industry for their area. Unfortunately, each of these four areas has suffered revenue losses due to poor operator performance and the delay in retendering the area. These areas included: Mumbwa East, Kasonso, Lunga-Lushwishi and Upper West Zambezi, which remains untendered.

The actual amounts that operators have invested in their concession areas are not well quantified, but a preliminary ranking is provided according to relative contributions and is shown in Table 16 below. Investments listed include only major capital improvements or procurements that improve wildlife production in the concession.

Table 16

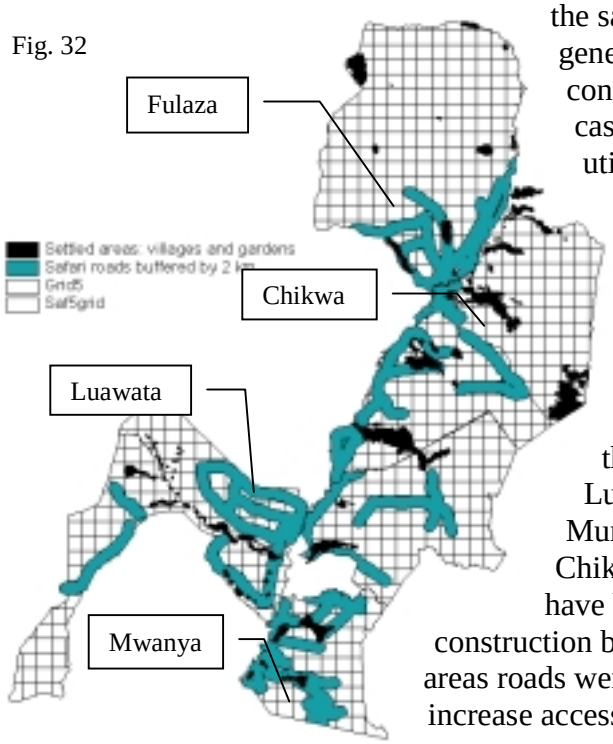
Company	Area	Contributions to wildlife management, excluding fuel and ration supplies support
Luangwa Crocodile	Sandwe	Opened new safari roads, repaired unit leader's land rover,
Luangwa Crocodile	Busanga	Repaired Unit's vehicle, purchased 11 bicycles for scouts, helped construct new camp with 3 houses, 4 tents and backpacks assisted HQ construction, lend use of radios for patrolling
Maninge Safaris	Lushwishi	Bonus system for poacher arrests, handcuffs for all scouts
		Repaired Unit Leader's vehicle
Africa Conservation	Mulobezi	nil
GameTrackers	Sichifulo	Repaired two borehole pumps
Eastern Safaris	Rufunso	(Data not collected)
Exclusive Safaris	Chifunda	Graded road access into GMA, 6 bicycles for scouts
Tudor Conservation	Luawata	Over 150 km of hunting roads graded
Nyampala	Nyampala	(Data not collected)
Hunters & Guides	W. Petauke	Over 100 km of new hunting roads, boots for scouts
Nyumbu	Mwanya	opened new roads, new fly camp, supported labor costs for opening up access road to area, borehole at U/HQ
Horizon Safaris	Chanjuzi	nil
Busanga Trails	Mumbwa West	(Data not collected)
Msikizi Safaris	Mumbwa East	Donated vehicle, employs area manager, resting area
Nyanga Safaris	Chikwa	Construct stores shed, opened up new roads on east bank

Sofram Safaris	Bililli/Nkala	nil
Hunt Zambia	Lower Luano	nil

2) Extent of safari hunting area utilized by operator

Safari hunting roads provide access for clients to the different hunting areas in a GMA. For the most part they are simple dirt-surfaced roads, annually cleared and maintained by the safari operator. Their distribution generally overlaps with the primary concentrations of wildlife, but in some cases wildlife resources remain under-utilized because of limited access. Figure 32 shows the distribution of safari hunting roads in five ADMADE hunting concessions in Luangwa Valley (excluding Sandwe and West Petauke). Roads were buffered with 2 km on each side to show the areas most likely visited by safari clients. Of the five units listed in Table 17 below, Luawata (upper concession in Munyamadzi), Fulaza (west bank of Chikwa/Fulaza concession), and Mwanya have benefited the most from increased road construction by the safari operator. In both these areas roads were extended away from the river to increase access to new hunting areas.

Fig. 32



An operator that invests in an increased road distance network in the hunting area and maintains the road annually will more likely provide increased hunting opportunities for his clients and thus offer a more successful hunt. In such cases road work becomes a major source of pre-season employment for local residents. In Luawata concession, for instance, approximately 60 people are employed each season just to help maintain the roads. In Mwanya about 20 people were employed. Roads can also provide an efficient way of patrolling the hunting area during the dry season to monitor the presence of poacher activity.

Only in Chikwa was there a major concern about inadequate road development because hunting roads have not been extended to areas where the community has helped control poaching and produce increases in wildlife. As a result, there has been no added income to reward their efforts. A likely reason for this is related to the large area of the hunting block, Chikwa plus Fulaza, which is 7100 km^2. With a limited 5 year lease, the operator has presumably limited his investment to the

Table 17			
ADMADE Unit	**2 km buffered safari roads**	**Total area (km^2)**	**Percent w/ buffered roads**
Chikwa	125	2425	5.2%
Fulaza	749	4675	16.0%
Chifunda	707	2104	33.6%
Chanjuzi	519	2555	20.3%
Munyamadzi	934	3176	29.4%
Mwanya	705	1587	44.4%

prime hunting areas rather than developing new areas.

Risks are associated with building new roads in a hunting area, especially if roads increase the level of human activity in the area to the detriment of the wildlife industry. One such case is Mumbwa where logging concessionaires made use of the hunting roads to access timber resources. This particular conflict was resolved by community pressures to force the timber licensing authority to ban timber cutting on their lands unless the local ADMADE leadership grants permission.

In both Lupande areas there has been a recent expansion of donor-supported all weather roads throughout much of the hunting areas. Unlike most other hunting areas where hunting roads terminate within the area, the new roads being built in Lupande are connected to access roads leading out of the GMA. Correlated with this road build-up is one of the highest outbreaks of elephant poaching over the past five years. Ivory dealers from local towns are now using vehicles to drive into the area from various directions at odd hours of the night to collect ivory from local hunters. Though these movements of ivory have been well documented for much of 1999, there have not been any arrests yet, suggesting increased difficulties in enforcing wildlife laws as the number of roads leading to urban areas also increase. Undoubtedly, there is movement of game meat out of the area as well.

3) ADMADE investment in wildlife management

a) Background

The basis for a strong and profitable partnership between the operator and the local community is for each to complement the other with their respective strengths and capacities to produce more wildlife for the commercial markets. There is some suggestion, however, that communities are having difficulty playing their intended ADMADE role in combating poaching and controlling land uses harmful to the industry. This difficulty is centered around the problem of revenues earned by ADMADE not being returned in full to the rightful community to support these management costs. As a result, a cascade of problems is beginning to develop in a number of ADMADE areas where high expectations are being matched with growing frustrations with the way ADMADE is being administered. Such problems include the following:

a) Professional hunters are being frequently requested to assist unit leaders with fuel and rations because the unit leaders complain they have no funds. Such over-dependence on the professional hunters increases the risk of denying the client the full services of the professional hunter. Not surprisingly, there is growing frustration among professional hunters with the way ADMADE is supporting scouts and field operations in their hunting area.
b) Absence of support to purchase rations for patrols has placed increased pressures on field staff to hunt illegally for game meat while on patrols. Such practices are illegal and can encourage field staff to expand this practice to support illegal marketing of game meat on a more serious scale. One such incidence occurred in Mulobezi in 1998 and resulted in the arrest of five scouts and the suspension of the unit leader for the area.

c) With improved training of village scouts and with the introduction of trained book-keepers who monitor revenue earnings, most scouts know the revenues their areas have earned and are also aware of the imbalance of funds not being returned to support their work. Trained and employed to protect wildlife resources for their community, village scouts in many units are expressing frustration that they cannot do the work they were trained for because funds are not reaching their units. As a result, morale is lowered and work output reduced.

b) Analysis of problem

Table 18 below provides a preliminary account of revenues earned in 1998 and their subsequent disbursements to the units as part of the 40% meant for wildlife management costs. Given that such disbursements represent the economic basis for ADMADE to promote community participation and commitment for wildlife management, it is of critical importance to evaluate how well the system works.

Table 18

	Revenue:	**Fixed costs:**	**Variable costs:**	**Monthly financial support:**		**Balance:**
Unit	40% share	Monthly fixed costs	Monthly balance for field operations	Total expected remitted per month to unit	Estimated actuals remitted to unit per month	Monthly outstanding not remitted
Chifunda	$20,560	$750	$1,005	$1,755	$1,583	$172
Chikwa	$21,480	$558	$1,273	$1,832	$868	$964
Mwanya	$26,480	$608	$1,640	$2,248	$733	$1,515
Mulobezi	$31,970	$569	$2,137	$2,706	$1,042	$1,664
Munyamadzi	$53,464	$1,021	$3,476	$4,497	$1,229	$3,268
Sichifulo	$24,234	$750	$1,311	$2,061	$1,083	$978
Chanjuzi	$29,050	$754	$1,708	$2,463	$883	$1,579
Mumbwa	$24,500	$854	$1,229	$2,083	$1,208	$875
	Average:	$733	$1,722	$2,455	$1,078	$1,376

The figures presented in Table 17 are based on safari hunting returns from the 1998 season and from financial reports provided by unit leaders and unit book-keepers. Monthly fixed costs are primarily salaries, bank charges and deductions for NPF. The monthly balance is the amount remaining after fixed costs are paid based on monthly allocations from total revenues earned for that year. In practice, funds were disbursed over periods of two to four months at levels that produced monthly averages provided under the column 'Estimated actuals remitted to Unit per month'. As shown in the last column, there were significant discrepancies, suggesting as much as half of the 40% share meant for wildlife management support was not returned to the unit.

It should be stressed that this analysis is preliminary and is only intended to demonstrate that an appreciable amount of funds meant for wildlife management in the field may not be reaching their intended targets. While these results should be corroborated with financial records from WCRF, they do provide a compelling explanation for the attitudes and perceptions among a growing number of field staff that management in the field is failing to adequately protect wildlife resources because full financial support is not forth-coming.

For example, 36 village scouts who participated in an advanced village scout training in data monitoring in May 1999 were interviewed to assess their views on adequacy of patrolling in their area and factors contributing to it. In total they represented 13 different ADMADE units. 64% felt that they were unable to patrol their units effectively and 45% expressed the view that lack of patrol rations was one of the main reasons for this problem. Additional factors sited as contributing to the low patrolling results were lack of uniforms, no tenting during wet season, poor transport, inadequate fuel, and lack of boots. Results are summarized in Table 19 below.

Table 19.

Item	Count	Percentage
Inadequate rations	26	45%
No tents	6	11%
No boots	4	7%
Inadequate fuel	4	7%
Poor transport	4	7%
No uniforms	4	7%
Few ammunition	2	3%
Poor roads	1	2%
Vehicle repairs	1	2%
no shortage	6	10%

Of these 36 village scouts, 16 expressed the view that morale among village scouts was low because of poor salaries and another eight felt morale was low due to such factors as poor accommodation and lack of field equipment as well as poor salaries. Only seven felt morale was high.

Both Unit Leaders and Village Scouts conceded that wildlife management was not being well supported by WCRF and that current levels of management were not adequate to protect wildlife in most ADMADE areas. The relatively small sums being provided for operational costs and the high percentage of scouts complaining of inadequate support for patrols (rations, tents, boots, etc.) tell a fairly compelling story that a potentially serious problem exists in the way units are being supported by their 40%. It is noteworthy to point out that this problem is recognized by many ADMADE-practicing communities, who have had to resort to using their own community development funds to assist in paying for costs of wildlife management. This was recorded for Chifunda, Mwanya and Munyamadzi. On the one hand it illustrates the level of commitment local leadership is making toward their wildlife but it also undermines the economic and social benefits ADMADE needs to support in order for communities to fully accept their responsibilities in protecting wildlife from wasteful and destructive uses.

Figure 33 summarizes the results of scout patrols in ADMADE area and clearly shows a positive relationship between size of patrol group and the percentage of patrols succeeding in making an arrest. It also shows the relatively high percentage of patrols having small patrol group size, a situation that would be expected if units are under-funded and experience shortages of rations. Similarly, length of the patrol would be expected to decrease if patrol rations were insufficient. Figure 34 demonstrates that one-day patrols are by far the most common but experience the lowest percentage of arrests.

Fig. 33 **Patrol summary by size of patrol group**

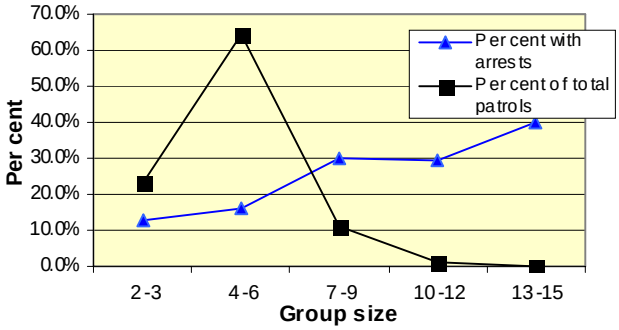
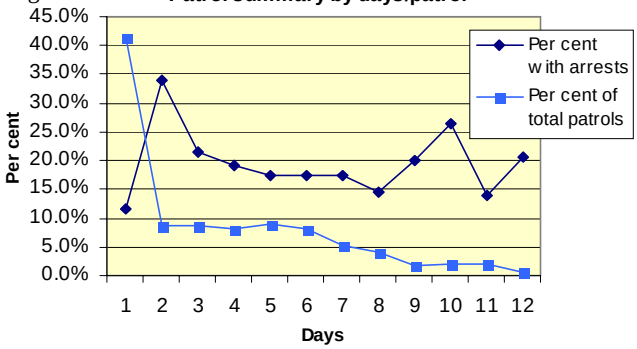


Fig. 34 **Patrol summary by days/patrol**



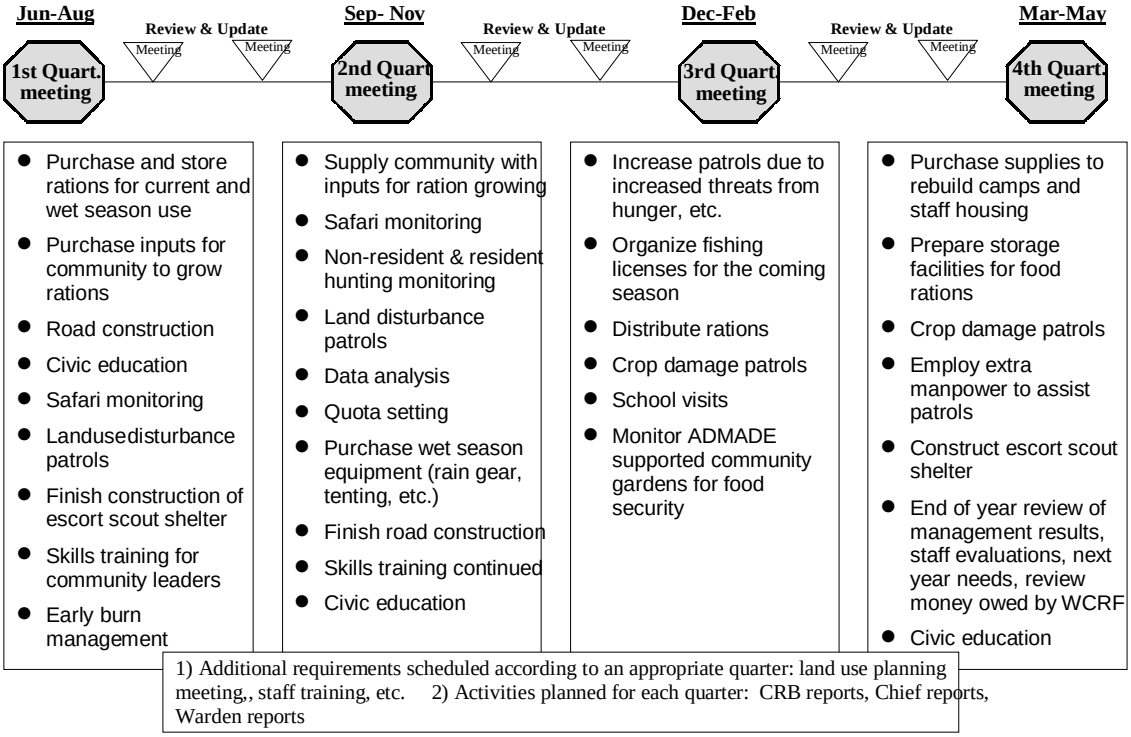
Of the eight units examined in Table 18, only Chifunda received its 40% share in full, although even in this case the amounts received were not consistent with quarterly budget requirements proposed by community leaders together with their unit leader. This problem was experienced among all unit leaders interviewed in this study and as a result they were often prevented from solving many management problems that predictably occur during the year and which could have been solved if funds had been transferred as recommended in the 1998 submitted budgets. Unit leaders complained that WCRF appeared not to be taking unit budgets seriously and felt that the annual budgeting exercise required of all unit leaders was largely a waste of time.

c) Proposed solution

Realizing that a primary objective of wildlife management in ADMADE is to increase wildlife production, key requirements that may be constraining production need to be identified and acted on as part of a quarterly workplan. It will also be necessary to budget these quarterly activities within the constraints of anticipated earnings for a given fiscal year and to insure these funds are remitted during the early part of each quarterly period. An analysis of these management requirements was carried out through a participatory appraisal process with 13 different unit leaders and a generalized quarterly workplan was formulated as recommended template for most units. This workplan is illustrated below:

Fig. 34

Management Requirements by Quarter



WCRF has the critical responsibility of providing the financial services to the ADMADE wildlife management units with the revenues needed and earned by local authorities to carry out the above workplan. The revenue returned to WCRF, representing 25% of ADMADE total earnings for a given unit, is provided in order that such financial management services can be provided. If funds are delayed or not paid in full, then the potential income earning capacity of the units as well as the private sector will most certainly suffer. WCRF should therefore adopt a reliable and transparent mode of payment to the units that corresponds to the quarterly budget needs of the units. Likewise, WCRF should also provide regular financial statements to the units and conduct periodic audit inspections to ensure unit budgets and required financial procedures are being followed.

Given the critical importance of WCRF's function to ADMADE's success and the fact that this study has suggested possible problems with the way resource management needs for the ADMADE units are being financially supported, a meeting has been scheduled by relevant officers of NPWS to adopt corrective measures as needed. This meeting has been scheduled for early July 1999.

4) Compliance of lease agreements

Monitoring compliance of lease agreements is an extremely important way for evaluating relative performance of individual operators in meeting industry standards. Furthermore, such measures could be important criteria for awarding future tenders as a way of improving the industry in becoming more competitive with its neighboring African states.

In recent years monitoring efforts by NPWS have improved considerably and this has come about largely by a trend toward increased information flow on operator performance and compliance to the lease agreement. Where serious violations have occurred, NPWS has shown decisiveness in canceling leases, which has been extremely positive for maintaining acceptable and competitive standards in the industry.

One particular problem that has arisen on numerous occasions is the allegation that an operator sub-contracts his area to another, more qualified operator. Such a procedure is highly unacceptable because it passes on higher costs to the client and lowers reinvestments to the concession area. It is a problem attributed to low ADMADE performance in Mumbwa East, Lunga-Lushwishi and Kasonso where previous operators lost their concessions. A possible weakness with the current lease agreement is that it does not provide explicit language on what legally constitutes sub-contracting and therefore accused parties typically deny charges and Government finds difficulty in defending its position. This is one area in which the current lease document needs to be carefully reviewed and strengthened before any new tendering.

In cases not as serious, other measures have been taken. Already mentioned is the awarding of the Conservation Bullet Award that recognizes operators for their commitment to the lease agreement. Recent efforts to improve dialogue between Government and private sector representatives to discuss issues and problems related to the industry have also been a constructive way to deal with problems of lease agreement compliance. One recent example concerned the employment of a public relations officer by the operator to help resolve conflicts and misunderstandings between the operator and the community. Initially the idea was met with skepticism and reluctance on the part of the private sector, though the requirement to employ such a person was part of the lease agreement. Documented information showed there were growing conflicts between local communities and the operators in a number of areas and that such conflicts were detrimental to the industry (e.g. theft of clients' property, vandalizing lion baits, excessive disturbances around lion and leopard baits, high incidence of snaring, etc.). Following discussions on this issue in April 1999, thirteen companies donated K300,000 each to Nyamaluma Institute to have a qualified local resident trained as a Community Liaison Officer. Subsequent to this training, two professional hunters from different areas were interviewed over their expectations of the liaison officers recently trained and now employed. Both expressed guarded optimism that the work of these community liaison officers would improve local cooperation with the industry and that they were willing to work with the liaison officers to help make their work successful.

5) Equitable financial return to the wildlife producer (community) vs service provider (operator).

This section examines the flow of revenues to the various stakeholders in the industry and in particular if revenue shares are likely to promote strong community support for managing wildlife through ADMADE in partnership with the private sector.

a) Revenue shares

Table 20 below examines the actual flow of gross revenues generated from a particular hunting area in 1999. These data were based on actual fees and numbers of animals shot.

Table 20.

Revenue description for single hunting block - 1998			
Revenue category	Rate/client	No. clients	Total
Classical safari fee	$5,050	4	$20,200
Mini safari fee	$750	10	$7,500
Animal fees	No. spp.	No. animals	Total
	15	92	$56,750
Operator fees	Rate	No. days	Total
Operator daily rate	$1,300	120	$156,000
License markup	20%		$11,350

Fourteen clients hunted a total of 120 days and harvested a total of 92 animals, representing 15 different species. A total of $56,750 was paid for animal license fees. Four clients hunted classical safaris and paid $5050 each for concession fee, sometimes called hunting rights fees. Ten hunted mini safaris and paid $750 for these concession fees. This particular company charged a daily rate of $1300 for all services inclusive.

Table 21

Distribution of revenue earned				
Revenue category	Community	WCRF	GRZ	Company
Concession fees	$20,775	$6,925		
Animal fees	$21,281	$7,094	$28,375	
Daily rates				$156,000
License mark-up				$11,350
Total:	$42,056	$14,019	$28,375	$167,350

The distribution of income is provided in Table 21 to the left. Based on the current percentages of income earned by the community, total revenue accrued to the community from animal license fees and concession fees was $42,056 and the balance of $42,394 was collected by WCRF ($14,019) and GRZ ($28,375). The amount earned by the community, regarded as the wildlife producer since the resource is being produced largely on communal lands, totaled 25% of the gross earnings of the company. As shown in Table 22, the total license value of wildlife produced on communal lands was taxed

Table 22

Value of wildlife produced on communal lands					
Income	Gross value	WCRF tax	GRZ tax	Net value	% of total
Licenses	$56,750	12.5%	50.0%	$21,281	37.5%
Hunting rights	$27,700	25.0%	0.0%	$20,775	0.75

62.5% and fees paid by clients for the right to hunt on communal land was taxed another 25%. These deductions represented a loss of potential revenue for the wildlife producer of $42,394.

The $42,056 accrued to the community is then shared between community needs and resource management costs. The net revenue for community benefits was approximately $21,500 in 1998. It is unclear what the operating costs for the operator are, but assuming his costs are 50% of the gross, the private sector still makes about four times what the wildlife producer earns. The community also incurs additional costs from living with wildlife, most notably crop loss and human injuries and in some cases human death.

Strictly on a percentage basis, communities appear relatively disadvantaged by being heavily taxed for producing wildlife (62.5% on licenses and 25% on concession fees). Given the added responsibilities and costs communities are burdened with to reduce poaching and land use disturbances (e.g. shift settlements away from hunting areas, control local fishermen, etc.), the industry would be better supported by imposing less deductions on community shares to encourage increased production of wildlife.

4. ADMADE policy variables

ADMADE was conceived as an alternative to a wildlife management approach that had become alien and too detached from the rural communities who shared their lands with wildlife. In stark contrast, ADMADE is based on transferring management responsibilities and wildlife benefits to local landowners. From ADMADE's beginning, there were few guidelines or lessons, either within Zambia or in the region, on how best to implement this community-based approach. Instead, the program adopted a rigorous monitoring of its efforts and results and used this information as basis to charter its own course.

Over the ensuing 10 years of ongoing program development, many lessons have in fact been learned and applied. One such lesson, which has become an underlying strength of the ADMADE program, is the importance of being culturally accepted as a basis for building national support for conservation, even at the highest political levels. Many Zambians in senior positions of Government have strong-felt pride and conviction in ADMADE as a Zambian approach to conservation. There have been numerous instances of senior Zambian politicians seeking advice on how ADMADE can be introduced to their constituency's area. Even traditional rulers from over six different areas have applied to NPWS in recent years to have their lands incorporated into the ADMADE program. With the belief that such applications will be considered, they have already begun encouraging their people to restore wildlife on their lands. In some cases as many as 30 local youths have been designated as unpaid village scouts to assist in these efforts. There are cultural reasons for this. Zambian traditions are rooted in village life and practices that once supported conservation values.

Unlike the past when conservation relied almost entirely on tactics of law enforcement, ADMADE has shown that community approaches are credible, less costly and far more culturally acceptable as a conservation approach. ADMADE is still very much an evolving program, or on-going experiment of ideas and methods, that represents a mixture of the new and the old, flowing together into a mix that attempts to merge the best of both into a more lasting solution for wildlife conservation in Zambia.

As new lessons are learned and methods for applying the community-based approach are improved, there is the need for policy frameworks to also evolve in order to reinforce these approaches with the assurances that Government is committed as a co-management partner with the community. This relationship between Government and local communities is manifested in the very laws, policies, and administrative oversights host institutions, particularly NPWS and the Ministry of Tourism, provide to the program.

ADMADE is now at a particularly important juncture in its history where the very promise for what this co-management relationship may hold for Zambia is being fully tested. On the horizon there does not appear to be a viable option for planning a long term economic future for wildlife without adopting some form of an ADMADE approach. Yet, there are still key questions unanswered that will likely be faced soon as the ADMADE experiment and its on-going results are embraced by the coming of ZAWA. Can Government divest enough control and authority to communities to enable landowners to more fully protect the resources needed by the wildlife industry? Can communities adopt modern management practices and make their efforts more accountable to Government authorities? Can these two entities relate to each other as professional partners in the business of promoting conservation and increased revenues? What variables are there in the policy environment that threaten the fruition of this co-management relationship? Will Government be able to respond to these threats, given the political realities of conflicting needs and priorities?

All of these questions essentially revolve around how well Government policy supports the continued advancement of CBNRM in Zambia. Presented are some of the key variables that remain in the balance and require full attention by Government to make the most informed decisions that best serve the continued strengthening of ADMADE:

1. Procedures of banking and disbursing community revenues
2. Revenue shares entitled to communities
3. Special license abuse
4. Tendering procedures for leasing concession areas
5. Protecting land tenure for communities
6. Extending ADMADE policy to encompass other resource sectors

Each of the above variables has a significant influence on CBNRM in Zambia and in particular the level of custodianship local communities can have for their land. With consideration of the previous analyses presented in this paper, the following recommendations are made on each of the above:

1. Banking and disbursement:
    a. Each Community Resource Board should have a Lusaka account for depositing all revenues collected by the licensing office for their concession. This will remove any question of misappropriation of community funds and will simplify audits of community accounts.
    b. Disbursements in support of resource management costs should be quarterly and consistent with community approved wildlife management budgets.
    c. Subsequent disbursements of resource management funds should be conditional on either an audit inspection report or a verifiable financial report for the previous quarter.
    d. Monthly earnings by unit need to be public information and shared with community leaders and other interested parties concerned about ADMADE's future.

2. Revenue shares:

a. Government should not tax communities more than commercial businesses for the sale of wildlife they produce on their lands. This should not exceed 15% (as opposed to 50%).
b. WCRF should not tax communities but should charge them for services they render to support their licensing, financial management and banking needs.
c. The above arrangements are conditional on full compliance by the community in meeting the conditions of its co-management agreement with ZAWA and its private sector partner.

3. Special licenses
   a. Special licenses should be based on a mutually agreed quota between Community Resource Boards and the Ministry of Tourism.
   b. Accountability of these licenses should be encouraged to protect against allegations of abuse by Government, thus weakening community resolve to protect their wildlife resources. Such records should be made public.

4. Tendering procedures for leasing concession areas
   a. Operators seeking to tender for a given concession should be required to meet with the CRB and develop a co-management agreement.
   b. This co-management agreement with the operator should be incorporated into the final tender application.
   c. Before tender documents are submitted to the final selection committee for review, initial applications should be first submitted to the Community Resource Board for review with the right of rejecting any applicant to ensure those selected will be welcomed and supported by the community.
   d. Conditions for how a sub-contract will be identified should be explicitly stated for purposes of monitoring this problem in all future leases.

5. Protecting land tenure for communities
   a. Communal land should be owned as a 'community trust' with overall executive authority retained by traditional rulers. This would enable communities to legally lease land and negotiate more directly with private investors without having to lose land through the use of title deeds.
   b. Traditional rulers in the past have been accused of selling communal land and thus denying their subjects of any future use of these lands. Such powers need to be questioned if community-based resource management is to involve community decisions through the Community Resource Boards. Approval of title deed applications should therefore require approval by the Community Resource Boards.
   c. To preserve the powers of Chiefs as traditional land owners, all decisions involving lease agreement on trust land or title deeds must require his/her approval.

6. Extending ADMADE policy to encompass other resource sectors
   a. Community Resource Boards should assume legal responsibility for the issuing of all licenses for all residents of the District on behalf of the District Council and these funds should be shared between the Community Resource Boards and the District Council.

b. The Community Resource Boards should assume the legal responsibility for enforcing laws to protect natural resources in their CRB designated area.

5. Donor relationship to CBNRM development and support

A key requirement for CBNRM success is for communities to recognize wildlife and related natural resources as valuable enough to encourage community-based protection of these resources. Over-reliance on donor funds may diminish the perceived value of the resource and may also detract from local stewardship of the CBNRM process if donor funds necessitate external personnel to administer the initiative as opposed to local leadership. Yet, donor funds are critical for start-up costs for a GMA to establish a successful CBNRM program. This section examines what the right balance should be and the appropriate targets for donor funds to support CBNRM efforts.

The maps below review the past history of donor support for CBNRM in specific GMAs. Exact levels of funding by different donors could only be estimated for this presentation but relative figures are believed to be accurate. USAID has provided direct support to GMAs in support of ADMADE in the range of $2 million, most of which was in the form of wildlife management field equipment and community training. This support targeted 10 ADMADE units. WWF provided four years of support to wetland GMAs at a funding level of about $250,000 and EDF contributed a smaller amount, approximately $150,000 to Lower Zambezi GMAs. NORAD has pumped in over $5 million to support an integrated rural development project in Upper and Lower Lupande GMAs. In total, these donor assisted GMAs account for 18 CBNRM units, leaving a balance of 23 non-funded ones (see Fig. 35). Of these 23 non-funded areas, 12 were supporting viable safari hunting industrie when ADMADE began in 1988 and of these nine (or 75%) have had their industries collapse because of depleted wildlife stocks (see Fig 36). Of the 18 with donor support, only one (6%) has suffered a similar fate, although an operator has begun reinvesting in it through the local ADMADE organization to help rebuild the area's wildlife.

Fig. 35

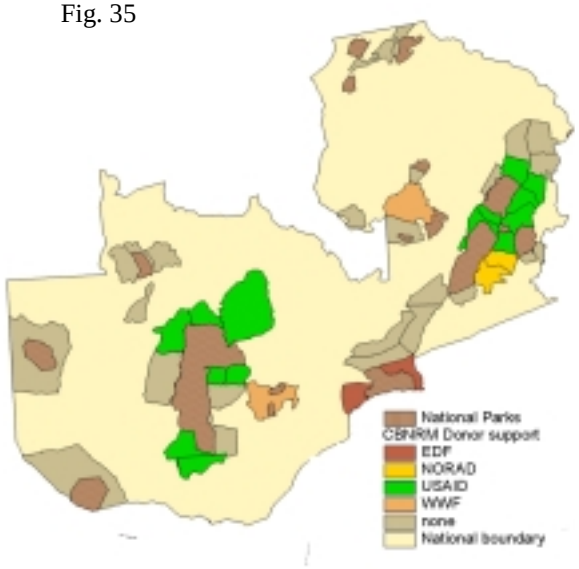
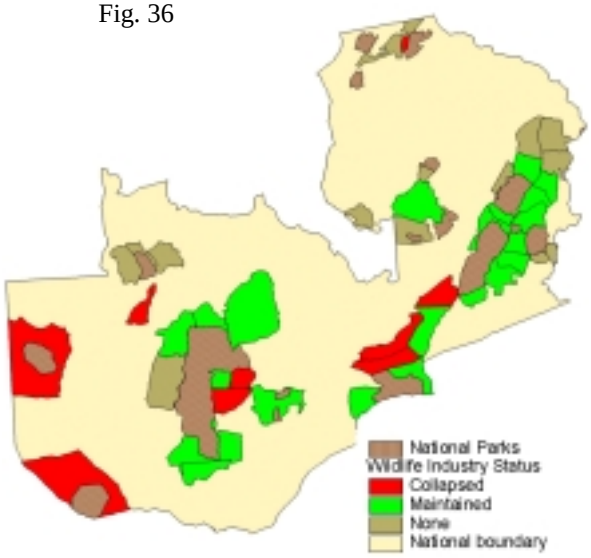
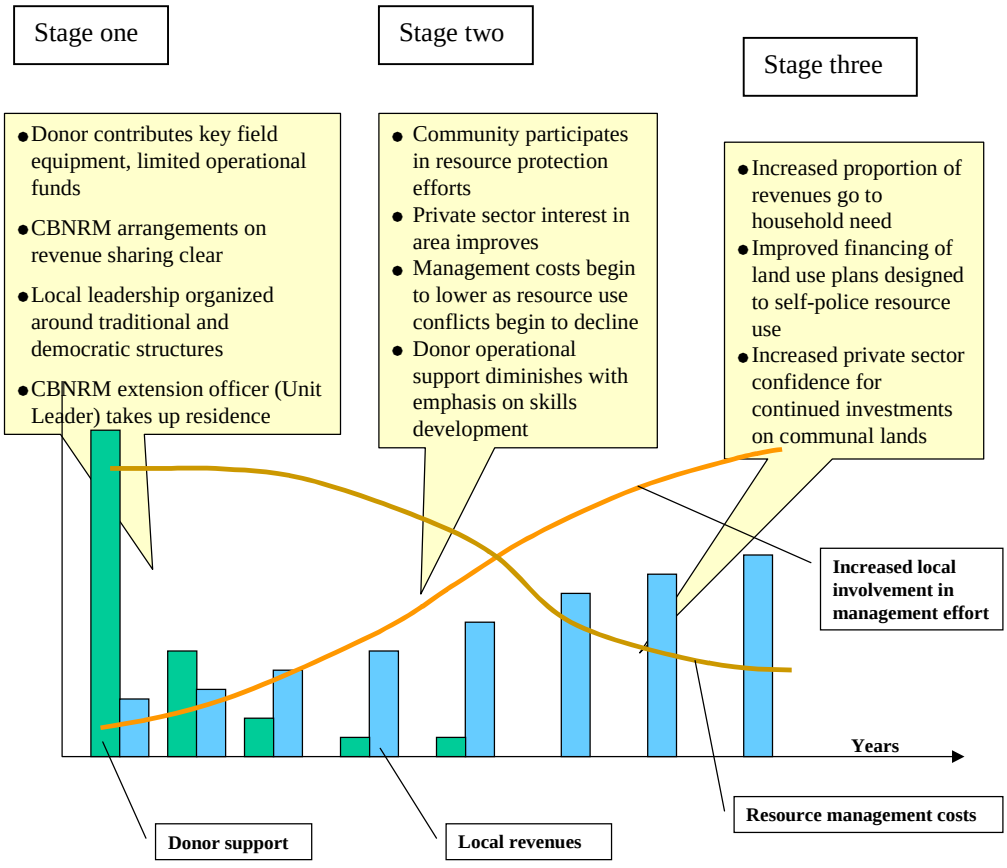


Fig. 36



This contrast between donor assisted areas and non-supported areas provides an important basis for arguing how critical initial donor investment is in the CBNRM process and helping sustain its long-term role for community development through conservation of natural resources. In the donor funded areas (excluding Lower Zambezi, which recently received support, and the Lupande areas, which continue to receive donor support), wildlife management has become entirely self-supporting, despite the problems identified in this paper related to returning revenues back to community authorities by WCRF. Complementing this achievement is the progressive trend among most of the participating communities of adopting more democratic approaches to how best their revenues should be used to support community needs. Based on the demise of the non-supported areas, it is strongly argued that without this prior donor support and without the CBNRM approach to reduce management costs through local involvement, many of these donor-supported areas would also have collapsed.

The overall dynamics of the interacting players in a sustainable CBNRM process, based largely on the experience of donor support in Zambia, are illustrated in the diagram below.



To a large extent the initial 10 units supported by USAID have reached stage two in the diagram below and the various donor variables that have most influenced the process are discussed below:

1. Capital start-up investment

a) The initial investment in CBNRM

When ADMADE was initiated, none of the 10 units funded by USAID (initially nine but one became subdivided) had vehicle transport or a radio for 2-way communications. Administrative facilities were also totally absent and as a result, administrative leadership for local management of wildlife resources was seriously impaired. These and a number of less serious problems threatened any credible wildlife management effort.

It was clearly recognized from this initial point that the introduction of CBNRM into these areas would require a modest injection of capital support. Secondly, it was accepted that this support, which was largely in the form of capital procurements, would be based within the community as an investment in local participation in the wildlife management effort. In the past, material support for wildlife management had been controlled at sector, district or provincial levels versus direct support to the actual areas where wildlife was being managed and commercially utilized.

With funds from USAID, each of the nine units were provided the following equipment: 1 4x4 landcruiser pick-up, 1 tractor and trailer, 1 HF radio, assorted office equipment, solar lighting, and a variety of field equipment, including tents, packs, and protective clothing. In addition, each of the four NPWS Command Headquarters, which provided logistical support to each of the units, was provided with 1 4x4 landcruiser and 1-7 ton truck. Approximate cost of this support per unit was $120,000.

Throughout the eight years since this support was provided, USAID has not provided any other direct investment of capital or operational support to these nine units. All salaries of village scouts and other personnel recruited to support the CBNRM process in the area have been entirely supported with revenues generated from the area itself. From the very onset, community leaders were told the support being provided by USAID was a one-off opportunity to secure the safety of their wildlife and to grow more wealth for their area through the ADMADE approach.

b) Investment returns

Annual ADMADE revenues average -- per unit among these same nine areas originally invested in by USAID. Tendering their hunting concessions has become highly competitive and demonstrates that the economic potential of wildlife in these areas has been maintained. Revenue levels over the past three years have remained relatively stable with a general increase among those operators meeting the Conservation Bullet criteria (2nd USAID Quarterly Report), suggesting a positive relationship between CBNRM and private sector profits. In five of the nine areas, communities have replaced their USAID purchased vehicles and a sixth area is planning a similar purchase for 1999. Permanent administrative office blocks have been constructed with community funds in six of the nine areas, providing an effective working environment for filing data, preparing reports, maintaining accounts, and so forth.

The above results suggest these initial capital investments have enabled the private sector to sustain the areas' basic management requirements while also providing substantial funds for community development. However, as has been pointed out in previous

sections, ADMADE's full return on USAID's investment will depend on future leadership by the Community Resource Boards and the full payment of ADMADE shares back to the community.

2. Training support

USAID has supported the initial costs of village scout and unit leader training at Nyamaluma Institute. More recently it has offered additional support through the same institution to promote civic education about the community's role in ADMADE as well as both formal and informal training of community skills needed to administer ADMADE. Funding levels have tended to average about $150,000 per year and have been a critical source of support for the progressive development of monitoring and research skills to manage their natural resources. Various technical communities have been established for all the Luangwa Valley units and a growing number from Kafue, all of which have begun to demonstrate impressive use of their ADMADE taught knowledge to track income earnings, plan and implement projects, and lobby effectively for their full transfer to community accounts. Most especially, community ownership of the ADMADE process has not been compromised by any efforts to use outside expertise to take away community responsibility for implementing ADMADE.

The progression of skills and increased level of participation has been a direct response to USAID's training support and has helped move the community's focus to the more far-reaching challenges of dealing with land use needs for their area. Key issues that affect how their area will look twenty years from now are becoming topics for ADMADE local meetings and this is of fundamental importance to its long-term success. Resolutions and decisions being made through an improved process of participation and dialogue include such issues as community support for family planning, improved food security planning, improving schools, and establishing no settlement zones for future wildlife development. This stage represents a very exciting period ADMADE is now entering for many of the units initially funded by USAID and while many variables will influence its outcome, there is guarded optimism that at least the process will be strengthened by a foundation of CBNRM skills.

One important training need that has not been given sufficient attention by the ADMADE program is tourism development skills for communities to participate more directly in the tourism industry. This is regarded as an important need to help increase the job opportunities from the resources communities are managing and protecting. ADMADE' primary source of revenue is the safari hunting industry and it is likely this will continue for the foreseeable future. While profits are extremely favorable for this dependence on safari hunting, there are some important disadvantages. Because of its relatively specialized services and low volume of tourists, job opportunities from safari hunting are very limited for local residents, normally less than 15 for the hunting season. Second, there is little likelihood in the near future that communities will have the necessary skills to actually own and manage their own safari industry and current efforts to improve the partnership relationship is probably the right approach. However, effort to strengthen the partnership basis for this industry continues, many communities regard the safari industry as a business that operates on their land but they themselves have little direct control or involvement in. Psychologically, this probably lowers the value of wildlife from the point of view of the community. Non-hunting tourism, however, does provide much

more opportunity for communities to participate in as actual owners and managers of tourist enterprises and could support a number of services resident would be able to provide to enable visitors to view wildlife and enjoy the natural landscape on their lands. Such services would include guiding, preparing meals, providing food, laundry, room attendants, traditional knowledge, curios, etc

Enterprise development in this sector requires that standards are high and services, reliable; all of which requires considerable training and skills development. This particular curriculum is now being developed at Nyamaluma Institute with the view that this training activity should be a major focus of continued CBNRM development in the ADMADE communities.

3. Donor-Government relationship

Throughout the ADMADE history USAID and the Government of Zambia have gained much from each other's views and concerns. In many ways, this dialogue has been a strategic basis for helping shape ADMADE's continued evolution and adaptations to rural development and wildlife management. One of the most interesting and important aspects of this relationship has been its openness to criticism and critical review of ADMADE's performance. In many ways, USAID has played a special role as mentor in rural development. It has done this by helping a Government department traditionally enshrined as a law enforcement agency for a natural resource sector to bridge itself with rural communities to more effectively engage them as co-managers of this resource. Undoubtedly there have been conflicts and misunderstandings along the way but out of such conflicts there has always emerged a closer, more congenial partnership between USAID and GRZ as well as a stronger ADMADE for Zambia.

Criticism by the donor should be welcomed and given forthrightly in a manner that builds increased solidarity for shared goals among the collaborating institutions. Currently there is need to improve the process where such dialogue could be more constructive in promoting CBNRM efforts by ZAWA, and such efforts are being demonstrated through the ADMADE Sustainability Project. As the host institution, ZAWA or the Ministry of Tourism should also take the initiative to improve opportunities for such dialogue and to facilitate an improved flow of information and discourse on CBNRM developments and results.

4. Recommendations

Capital support of viable, understocked areas

a) Having seen 75% of the non-donor funded GMAs lose their wildlife industry with total loss of revenue support for the local communities in these areas, it is strongly recommended the same level and conditions of capital start-up support be provided to these same areas.
b) Conditionalities may be required to ensure private sector leasing is favorable for long-term sustained support for continued recovery of these areas, revenue sharing arrangements enable communities to realize the full benefit of producing wildlife on communal land, and so forth.

c) Special consideration should be given to particular areas that would be geographically linked to other areas for the overall protection of key ecosystems or protected areas in Zambia.

Matching grants for land use initiatives for existing areas

a) As Community Resource Boards become more advanced in their skills and responsibilities for managing large land areas for resource-based income generation, solving land use conflicts that may threaten the long-term viability of these resources will likely become an important priority. Committing community resources for this purpose could be encouraged and strengthened by offering matching grants directly to the CRB on the basis of sound proposals that represent important contributions to CBNRM. Results would provide a further catalyst for similar efforts in other GMAs.
b) Regionally located institutions could help administer and monitor these self-matching grants.

Matching grants and continued support for skills development

a) As communities continue to develop their CBNRM programs, there will be a growing need to diversify the training to embrace other resource use options and ways households can be rewarded for their support of CBNRM. Equally important is the need for communities themselves to invest in this training to raise the level of commitment in applying these skills. Likewise, there is need for local training institutions to support these training needs, and this will more likely be done if financial incentives sustain their commitment to this cause. It is therefore recommended that training investments by communities be matched with a donor grant to enable greater options for training needs to be sought from the various institutions seeking to support CBNRM skills development in Zambia.
b) Skills development to promote community ownership and management of tourist facilities on their lands should be a priority for continued training support of ADMADE. Such support would include skills on siting, designs, building skills, tourist service skills, cultural and curio products, and development of brochures and marketing. Those communities that have already established their CRBs and have successfully maintained healthy wildlife populations on their lands would probably the first communities to participate in this training to establish a set of working examples of community participation in the tourist sector.
c) Given the problems ADMADE units have experienced over the past year in following community approved budgets, there is much need to provide on-site inspection and auditing of financial performance by the communities. This would allow inspectors to verify compliance of financial management procedures and to also assist with further training needs as identified while on an inspection.

6. Making solutions work for CBNRM: A synthesis

Many variables operating at different levels of influence affect the success of a CBNRM program. Controlling these variables to enhance CBNRM success is not easy and undoubtedly there will be many disappointments along the way. Yet, the possibility that communities can live sustainably with their natural resources is a vision that Zambia and

all of humanity must keep in focus, especially as global resources continue to diminish worldwide.

Like many sciences, important insights come about from tinkering around, trying different recipes to a problem and closely observing their results to ultimately improve the final product. In many ways, ADMADE has been similar and indeed many lessons have been learned. But ADMADE is much more than a collection of adaptive research results. It represents a fundamental trust between communities who live communally on their traditional lands and the people who reside far away in Government offices where policies and laws regulating resource use on these lands are written and enacted.

The Zambian Government has been extremely progressive in its thinking about CBNRM and supportive of it. Without this commitment, all else would certainly fail, regardless of how technically correct CBNRM lessons and methodologies might be. What may threaten this commitment are the variables that all Governments undoubtedly face: conflicts of interest, mismanagement, lack of funding, and so forth.

Pressures to resist such declines in commitment must be made in good faith by all the concerned partners who work with Government: NGOs, private sector, community leaders, and traditional rulers. This is not easy, no bureaucracy is. It often seems like a random walk, forging opportunities as they arise; but over the long-term, Government must remain clear and steadfast to the critical need for communal landowners to shoulder the responsibilities for their natural resources and be rewarded for producing the resources the national economy requires. And in the end, it is hoped, a sovereign state will emerge with a land policy that will protect its natural resources and the benefits that they can provide for generations to come.

The ADMADE process is well designed for this very purpose because of its broad and growing acceptance by the very people who once represented such a serious threat to natural resource conservation in Zambia. Within this paradox is the very reason why the CBNRM approach should be at the very core of Zambia Wildlife Authority future mission to conserve and develop wildlife resources in this country.

What this study has shown perhaps more than anything else is that the CBNRM process is working, with many indicators showing this, but its results are far below the full potential it holds. Part of the problem may be time, time for communities to develop and grow with the level of skills they need, and no doubt bottlenecks in program administration have hindered these results and lowered expectations while fueling criticism among the skeptics. What is also very clear from this study is the rich foundation of experience Zambia has acquired from the ADMADE program. It is on this foundation that Government, communities, donors and all parties involved should recognize for its strengths to build from rather than dismantle in search of an alternative approach because of its weaknesses.

Perhaps more reassuring than any other fact about ADMADE progress is its single, most impressive achievement. Nine of the 10 units that were recipients of USAID seven years ago are now supporting their CBNRM running cost entirely with their own wildlife generated revenues. This represents more than a third of the entire GMA land area in Zambia, and the future of wildlife in these areas is relatively secure for the foreseeable

future as continued improvements to ADMADE are made through its on-going efforts to adapt management to monitoring results. In each area trained CBNRM facilitators have taken up residence with the local communities and continue to transfer appropriate skills and knowledge for enhancing CBNRM success, and a nationally supported training institute promotes the on-going development of new skills and methodologies for strengthening the ADMADE process over the long-term. Building on these strengths should form the basis for a strategic plan that will enable more communities that recognize the economic value of their wildlife to invest land and resources into a CBNRM enterprise for their communitys' development.